ROLE PLAYING Learn why companies are embracing role-based systems for doling out network access rights to end users. Page 14.

LUCENT LANGUISHES Brutal layoffs and corporate restructuring are changing the face of the struggling telecommunications vendor. Page 12.

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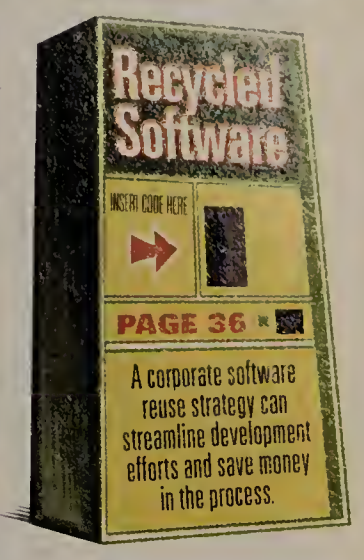
NetworkWorld

July 30, 2001 Volume 18, Number 31

The network portal: www.nwfusion.com

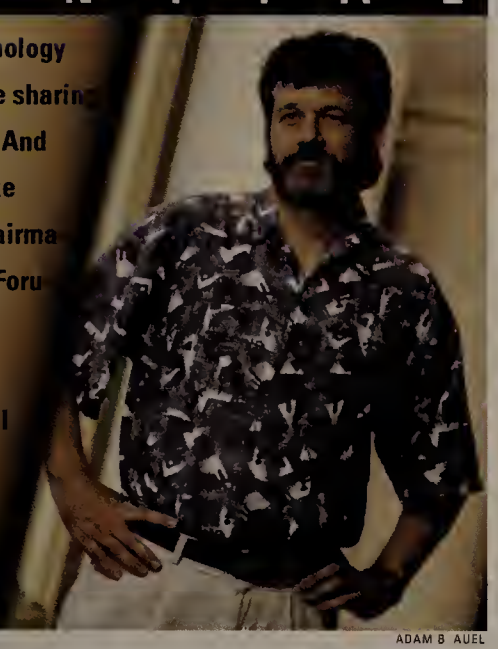


POTENTIAL

PEER-TO-PEER

Peer-to-peer technology can be used for file sharing and collaboration. And P2P proponents like Charlie Catlett, chairman of the Global Grid Forum, are taking unused computing cycles and building virtual supercomputers.

PAGE 44



ADAM B AUEL

ISPs reluctant to offer relief for dial-up users

BY DENISE PAPPALARDO

Some of the largest ISPs in the U.S. have no plans to upgrade their dial-up networks to support the latest modem standard, despite the fact that millions of users depend solely on dial access when on the road or working from home.

The International Telecommunication Union's (ITU) V.92 standard, which was ratified in November 2000, offers users three benefits: faster modem connections, faster upstream speeds and the ability to put a data connection on hold to answer a voice call, often called Internet call waiting.

Cable & Wireless, EarthLink and WorldCom's UUNET say they have no plans to upgrade. Sprint, AT&T and Genuity say they will eventually support the new standard and are in various stages of testing products. NaviPath of Andover, Mass., is the only ISP that has bitten the bullet and upgraded its network to support V.92.

See **V.92**, page 64

www.nwfusion.com

QUICK CONNECTION

Read how V.92's additional features over V.90 may make happier dial-up users.

DocFinder 5342 find it online

Pace of industry M&As continues to slow

BY MICHAEL MARTIN

Merger and acquisition activity in the network industry continued to slow during the second quarter, a trend that's expected to keep up for the foreseeable future as companies pay more attention to their bottom lines than expanding their product portfolios or customer bases.

That is the upshot of the first quarterly Broadview/Network World Quarterly Merger Survey, a new report of mergers and acquisitions made by the Network World 200, the 200 largest U.S. network companies based on revenue.

The NW200 made 36 acquisitions worth a total of just more than $5.3 billion during the second quarter, and while that might seem like a lot, it pales in comparison with the more than $25.7 billion spent on 83 acquisitions in the second quarter last year.

See **Merger**, page 65

WHAT END USERS HATE ABOUT YOU

BY ANN SULLIVAN AND JENNIFER MEARS

Admit it. You love to rag on end users. RinkWorks' Computer Stupidities site (www.rinkworks.com/stupid) is overwhelmed with anecdotes from IT professionals about stupid end users. In fact, the site has a backlog of 800 postings and is not accepting new submissions.

But have you ever wondered what those end users really think about you, the [illegible] professional?

We asked more than a dozen users about their biggest IT pet peeves.

Most spoke on the condition of anonymity, reluctant to end up with hard drives erased or network access severed. Still, it should be noted that most prefaced their fault-finding comments with positive observations. With that in mind, think about whether you're guilty of committing these most-hated offenses.

1 Geek speak

Sometimes the most talented IT people are the least effective instructors because they can't communicate well and don't understand that

See **Hate**, page 16

MICHELLE BARBERA

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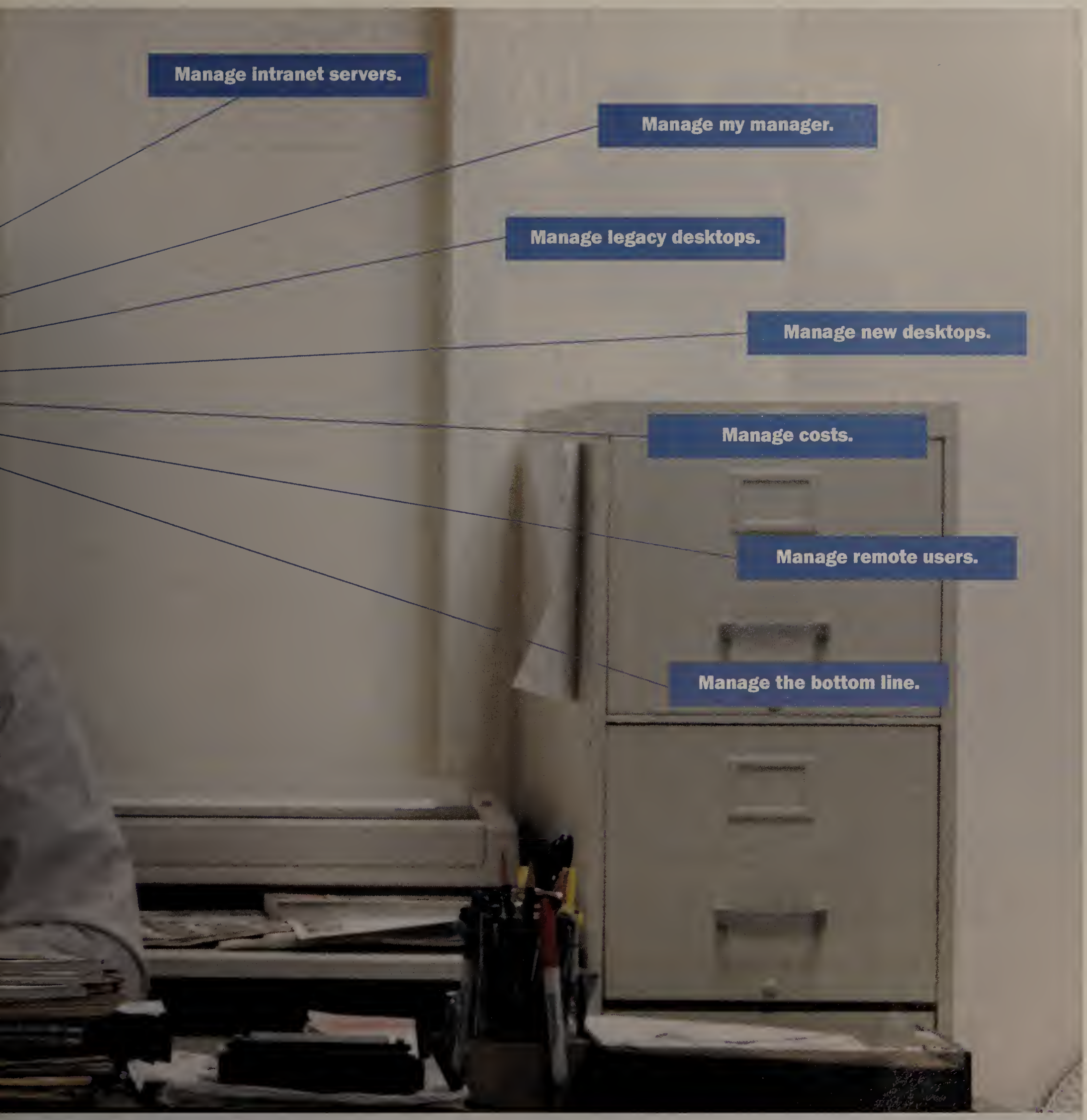
We've made the Windows 2000 platform more manageable than ever. For obvious reasons. Clearly, you have a lot on your mind these days. But now there's help: Microsoft® Windows® 2000–based management solutions are designed to simplify your workload. Companies such as Data Return, Eaton Corporation, and Northrop Grumman Corporation, working with service partners such as Compaq, are using these solutions today. As a result, they're realizing reduced IT management costs, higher profitability, and increased customer satisfaction. For more information on how to better manage your Windows-based infrastructure, visit **microsoft.com/business** **Software for the Agile Business.**



Active Directory™ service and Group Policy features in the Windows 2000 Server Family simplify management, strengthen security, and extend interoperability across both users and devices.

Application Center 2000 provides integrated tools for deployment, management, and monitoring of Web applications, making the management of Web server farms as simple as managing a single server.

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Systems Management Server 2.0 provides comprehensive hardware and software inventory, enterprise software distribution, remote control, and software metering for Windows-based desktops and servers.

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NetworkWorld

JULY 30, 2001

Feature: It's small, it's fast, it's unbreakable, it's AES – the new advanced encryption standard that's replacing DES and Triple-DES. **Page 49**

Feature:

Top ISP REPORT

Page 50

Face-Off: Is the enterprise ready for virtual routing? Gerald Wesel, president and CEO of Crescent Networks squares off against Troy Dixler, co-founder of Allegro Networks. **Page 43**

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THIS WEEK ONLINE

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FORUMS

The PC's 20th anniversary

IBM released its first PC 20 years ago. OK, everybody, get misty-eyed and reminisce — or kvetch. Anybody remember MS-DOS 1.0? **DocFinder: 5334**

The end of Lucent?

Lucent will lay off another 15,000 to 20,000 employees. Losses are in the billions, and it has sold its fiber-optics unit. Is this it for Lucent? What do you think? **DocFinder: 5335**

NetWare Client problem?

A user working with Windows 2000 Pro workstations says that after he installs NetWare Client 4.8, Office 97 or Excel hangs for 2 to 3 minutes before loading. Suggestions? **DocFinder: 5336**

TESTER'S CHOICE

Inventing the zeroeth layer

Our guest columnist this week writes:

"With various benchmarks that test network product speed, congestion and even bizarre data types, our industry presumes a great deal about this underlying but unmentioned layer of the ISO/OSI stack." Read more online. **DocFinder: 5337**

Best Boss survey

For an upcoming Signature Series feature, we're looking for IT executives who make great bosses. If you think your boss qualifies, please let us know by filling out a short survey online. **DocFinder: 5338**

CARUSO'S CACHE

The best of the NetFlash daily newsletter

Russian nuclear tracking software had glitch

It's one thing if a bug in a Microsoft product lets a hacker turn your e-commerce Web site into an 'N Sync fan page. It's quite another if a Microsoft bug causes nuclear superpowers to lose track of weapons of mass destruction. Software based on Microsoft's SQL Server was given to the Russians to help them track nuclear material, and the Russians have just discovered that, sometimes, files just become invisible and inaccessible, meaning someone could make off with nukes and no one would know. **DocFinder: 5345**

Sun, HP open code to developers

While Microsoft continues to stand against open source software, Linux, Sun and Hewlett-Packard this week are giving more of their software to the movement. Sun is releasing software for distributed computing, and HP is releasing a development platform for pervasive computing. **DocFinder: 5346**

Sircam virus eludes Symantec antivirus scanning update

The Sircam virus managed to outwit the virus hunters at Symantec, at least for a while. The first virus update the company sent out in response to Sircam's spread failed to detect it. **DocFinder: 5347**

Hole found in SSH remote-access software for Unix

If you have accounts with passwords of two characters or less, SSH Secure Shell 3.0.0 has a bug for you. For any accounts with passwords that short, no password at all is needed. **DocFinder: 5348**

— Jeff Caruso, managing editor, online news

Sign up for this e-mail newsletter online. DocFinder: 3850

COLUMNISTS

Compendium

Virtual reality that shocks

Fusion Executive Editor Adam Gaffin discovers a game controller that momentarily paralyzes users when their on-screen characters get injured. Ouch. **DocFinder: 5339**

Help Desk

How to install SLP

Ron Nutter helps a user install SLP on Novell WAN servers. **DocFinder: 5340**

Keeping Current

Don't discount Dell

Fred McClimans sees Dell moving closer to being the complete infrastructure vendor for small to midsized shops. **DocFinder: 5341**

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NEWS BRIEFS, JULY 30, 2001

AOL to trial interoperable IM

AOL Time Warner is testing a communications protocol that lets users of its instant messaging service chat with users of other nonaffiliated instant messaging services — a key milestone in the development of open, Internetwide instant messaging. AOL is running an internal test of the SIP (Session Initiation Protocol) for Instant Messaging and Presence Leverage (SIM PLE) protocol under development by the Internet Engineering Task Force, according to a document filed with the Federal Communications Commission last week. AOL Time Warner plans to conduct a trial of its SIMPLE-based interoperability technology this summer. AOL Time Warner rival Microsoft already selected SIMPLE for MSN Messenger and Windows XP, due out in September. Based on the telephony-oriented SIP, SIMPLE lets an end user determine if someone else is online and communicate in real time with that person regardless of the ISPs or instant messaging services the two people use. Today, end users can chat only with other users of their instant messaging service.

Red ink, layoffs worsen at HP

Hewlett-Packard last week slashed revenue forecasts for its fiscal third quarter and announced it is laying off an additional 6,000 employees due to "deteriorating global economic conditions and related weakness in technology spending." The company says it expects its revenue for the quarter ending July 31 to decline between 14% and 16% year-over-year. "Economies around the world continue to weaken as we move through the quarter," says CEO Carly Fiorina. The company says its consumer business suffered the brunt of the spending slowdown. HP also announced last week it will acquire StorageApps, a New Jersey enterprise storage vendor, in an all-stock transaction valued at $350 million.

HP's Fiorina: Economic's continue to weaken.

Senator calls for Microsoft probe

Sen. Charles Schumer, D-N.Y., last week called for an investigation into "anticompetitive" practices in Microsoft's forthcoming Windows XP operating system and urged the U.S. Department of Justice to make the cessation of such practices a condition of any settlement in the government's antitrust case against the company. Schumer demanded Microsoft change XP to let users choose their media player, messenger service and other applications, according to the senator. Schumer will call on state attorneys general to look into enjoining the release of the operating system. XP has raised concerns about threats to competition because of the way it integrates components such as Windows Media Player and MSN Messenger into the operating system. Two New York companies, AOL Time Warner and Eastman Kodak, would be adversely affected by Microsoft's plans, Schumer says.

Layoffs hit IBM's Tivoli subsidiary

IBM subsidiary Tivoli Systems last week said it would lay off 250 of its 4,250 employees. The cuts represent about 5% of the company's staff. U.S. offices will lose about 90 staff members in Austin, Texas; 75 in Raleigh, N.C.; and 25 in San Jose. IBM reported July 18 that software revenue declined to $3 billion, down 5% from the second quarter of 2000. That report stated: "Tivoli revenue declined as a result of continuing transitions in this unit's product line. Tivoli's decline adversely affected IBM software revenue by approximately five points of growth."

Sircam virus gives Symantec headaches

The Sircam computer virus eluded Symantec's corporate and consumer Norton Anti-Virus products; the first software update Symantec created to combat Sircam failed to detect the virus through e-mail scanning at the gateway and desktop. Although Symantec's first e-mail scanning defense for Sircam on July 17 didn't flag the virus appropriately, Symantec says users weren't completely defenseless. That's because Norton Anti-Virus has a kind of second-tier protection called Auto-protect, which Symantec says could detect and warn against Sircam as a user sought to open the Sircam-infected attachment. A second anti-Sircam patch was made available at Symantec's Web site last week.

Congress to monitor Carnivore

The U.S. House of Representatives last week approved legislation requiring the FBI to report annually to Congress detailed information about its use of the DCS 1000 e-mail and Internet surveillance system. DCS 1000 is more commonly known as Carnivore, the system's former name. The bill requires officials to disclose the number of times DCS 1000 was used during the preceding fiscal year and the number of times the FBI petitioned for its use. Officials also must reveal which courts approved each use of the system and which statute was relied on each time to authorize use.

SonicWall boosts VPN software

Upgraded software handles up to 1000 devices.

BY TIM GREENE

SUNNYVALE, CALIF. — SonicWall is upgrading its management software to make it easier for customers to set policies and monitor large site-to-site VPNs that are based solely on SonicWall's VPN gear.

Global Management System (GMS) 2.0 lets users manage 10,000 pieces of SonicWall VPN hardware, a tenfold increase over the maximum.

The devices managed by GMS 2.0 include stand-alone SonicWall firewalls and VPN software.

SonicWall devices connect corporate sites over the Internet to central sites, protecting data by sending it through secure IP VPN tunnels.

SonicWall's upgrade follows a recent trend: vendors improving the management of site-to-site VPNs to help users avoid having to manage large numbers of firewall/VPN devices one by one.

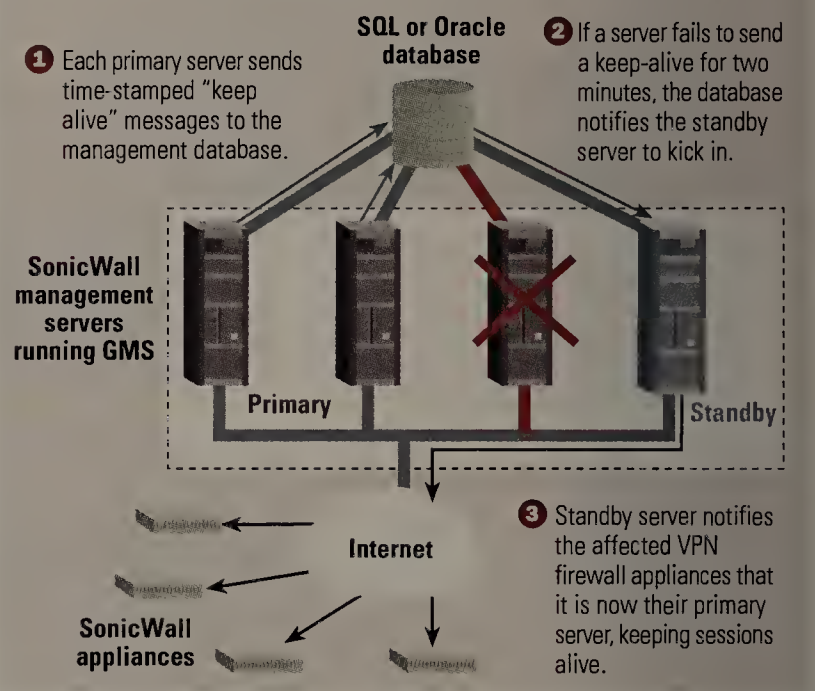
Competitor Check Point Software recently announced a major upgrade to its firewall/VPN management software to simultaneously handle more devices, as did Cisco.

The updated GMS platform runs on a workstation linked to a policy database and a set of servers that transfer management data back and forth with the remote firewall/VPN appliances.

The improved GMS system supports a failover mechanism, so if one management server fails, others can pick up its duties (see graphic).

Watching your back

SonicWall's Global Management System (GMS) software lets users keep VPNs connected in the event of a server failure.



These management servers, called agents, are comprised of software that runs on Windows NT or 2000 or Sun Solaris servers.

Each hardware server supports 1,000 SonicWall devices, and GMS 2.0 can oversee up to 10 of these servers, giving administrators the ability to control up to a 10,000-node VPN from a single management station.

GMS 2.0 also makes it possible for companies to authorize multiple system administrators, each with different access rights.

This feature is desirable because it lets users segregate administrative authority, says

See **SonicWall**, page 65

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Tivoli updates laptop management tools

Companys' enhanced products ease software updates and help keep track of mobile inventory.

BY DENISE DUBIE

AUSTIN, TEXAS — Network managers supporting many mobile users may want to check out the latest versions of Tivoli's software distribution and inventory tools, unveiled last week.

Amid news the IBM subsidiary is laying off 250 employees (see related brief, page 8), the company upgraded its Tivoli Software Distribution and Tivoli Inventory software products. The two are sold separately, but customers could benefit by using them in conjunction to perform software upgrades and help-desk tasks, the company says. Among the enhancements in both new releases is more support for mobile users.

The software distribution tool now gives laptop users the ability to download software upgrades as needed, to pause and resume downloads, and to reject downloads. It also now performs byte-level differencing, which lets net managers distribute just the data that has changed to a PC or laptop. This cuts down on network traffic and bandwidth use.

The inventory tool can track data, such as software changes and license compliance, and store it as history on disconnected laptops, which will help network administrators maintain an accurate record of the software on the machine.

A recent study by market research firm IDC shows IBM/Tivoli leading the market in change and configuration management software with 18.7% market share. Computer Associates is right on its heels with 18.3% of the market.

Although software distribution has traditionally been one of Tivoli's strengths, competitors have been gaining ground. CA's Software Delivery product already boasts similar pause-and-resume features — and while Tivoli says its laptop management is the first step toward managing handheld devices, CA's software already supports Palm OS and Windows CE devices.

Rich Miller, manager of information systems at Highmark Blue Cross Blue Shield, has used the two products for more than three years. The latest releases, Tivoli Software Distribution 4.1 and Tivoli Inventory 4.0, appeal to him because there are several laptops among the 11,000 endpoints he manages. Miller likes that his laptop users can choose not to execute large downloads when they are on the road.

"These tools quickly identify which PCs need upgrades and keeps a record for us. It makes the administration much, much easier," Miller says. "We used to have to do everything manually."

He adds that implementing the Tivoli products was "painful" three years ago because Tivoli was expanding at the time and its services suffered. In the past two years, Miller reports Tivoli has improved its customer service, and he expects to take the software distribution and inventory products onto a live network without any problems.

Available now, pricing for Tivoli Inventory 4.0 or Tivoli Software Distribution 4.1 starts at $31 per endpoint, with the cost decreasing as the number of endpoints increases.

Tivoli: www.tivoli.com

IBM peddles Web protocol

BY CAROLYN DUFFY MARSAN

IBM is trying to corral network industry support for a communications protocol that enhances the reliability of the HTTP underpinning most Web traffic.

The new protocol — dubbed HTTPR for Reliable HTTP — ensures that a message gets delivered over the Internet to its destination application only once or gets reported as undeliverable. HTTPR is geared toward business-to-business communications over the Web, such as ordering a part or processing a purchase order, where a message must be delivered once and only once to its intended receiver.

IBM engineers designed HTTPR to work with other nascent Web services protocols such as the Simple Object Access Protocol for XML message formatting, Universal Description Discovery and Integration for directory services, and Web Services Description Layer for describing Web services and service providers.

"Reliability needs to be an important part of the standards stack for Web services," says Bob Sutor, director for e-business standards strategy at IBM. "You can put [reliability] into the application level or you can drop it down to the transport level . . . HTTPR fits in at a level underneath the applications to keep the application logic a lot simpler."

HTTPR defines a set of conventions that developers can use to define how messages will be exchanged between Web applications in a reliable fashion. HTTPR runs on HTTP 1.1 and sends messages that look like regular HTTP traffic.

HTTPR requires support in Web server software, Web applications and messaging agents. IBM has not announced plans to support HTTPR in its WebSphere software, but the company expects to release preliminary HTTPR code on its AlphaWorks Web site in coming months.

"We think it's pretty well cooked," Sutor says, noting that HTTPR was designed by the same engineers that work on IBM's MQSeries, which many large organizations use for internal messaging.

IBM published the HTTPR specification on its DeveloperWorks Web site last week in the hope of generating industry feedback. IBM also plans to pitch HTTPR to a standards body such as the Internet Engineering Task Force.

HTTPR can be viewed at www.ibm.com/developerworks/webservices/library/ws-phtt/. ◪

Novell to boost 'Net mail system

BY DENI CONNOR

PROVO, UTAH — Novell is readying more collaboration capabilities for its Internet mail system, enhancing the software's appeal as an alternative to beefier groupware systems such as Lotus Notes/Domino, Microsoft Exchange and even Novell's GroupWise.

The Novell Internet Messaging System (NIMS) 3.0 features new calendaring capabilities, as well as the ability to let end users create notes and schedule tasks and meetings. NIMS, which has attracted 5 million users since Novell introduced it two years ago, is aimed at schools, large organizations, service providers and deskless worker environments.

"In many situations, a heavy messaging system isn't needed," says Richard Bliss, product manager at Novell, which boasts 25 million GroupWise users.

Internet messaging systems can be easier to roll out and manage than full-blown messaging systems in that 'Net-based systems typically require the downloading of much less software and can be accessed from any PC, kiosk or device with a Web connection.

Instant messaging growth

Novell Internet Messaging System (NIMS) has an estimated 5 million users after two years, while the company's 10-year-old GroupWise has 25 million users.

At Georgia State University, 30,000 students use NIMS.

"We looked at Exchange and GroupWise, but they offered too many options and didn't follow any calendaring standards such as iCal [the Internet Calendaring and Scheduling specification]," says Sam White, NetWare/Windows NT server support manager. The university uses GroupWise for its faculty and other employees.

With NIMS 3.0, students can not only send and receive e-mail, but can also keep personal calendars of classes and activities, and add notes on particular subjects.

The NIMS server software supports any Post Office Protocol 3 or Internet Message Access Protocol mail client, and any device that supports WML or Wireless Application Protocol. Novell also provides a thin Web-based mail client for any user with browser access.

"Students can use the Web Mail client that comes with NIMS or Microsoft Outlook, Eudora, Netscape or even GroupWise mail clients," White says. "They can get mail from any browser anywhere on campus."

NIMS also works with Novell's eDirectory for management and its system-wide address book capability. NIMS can also work with many domains, and the management of each can be relegated to individual customers or departments.

NIMS' features are closest to those of Netscape's iPlanet mail system. However, the iPlanet offering requires separate calendaring and wireless servers, and does not support NetWare servers. Other Internet mail packages, such as Sendmail and Openwave, have no directory or calendaring support.

NIMS 3.0 costs $9 per user. It works on NetWare, Solaris and Linux servers. Windows 2000 server support is planned.

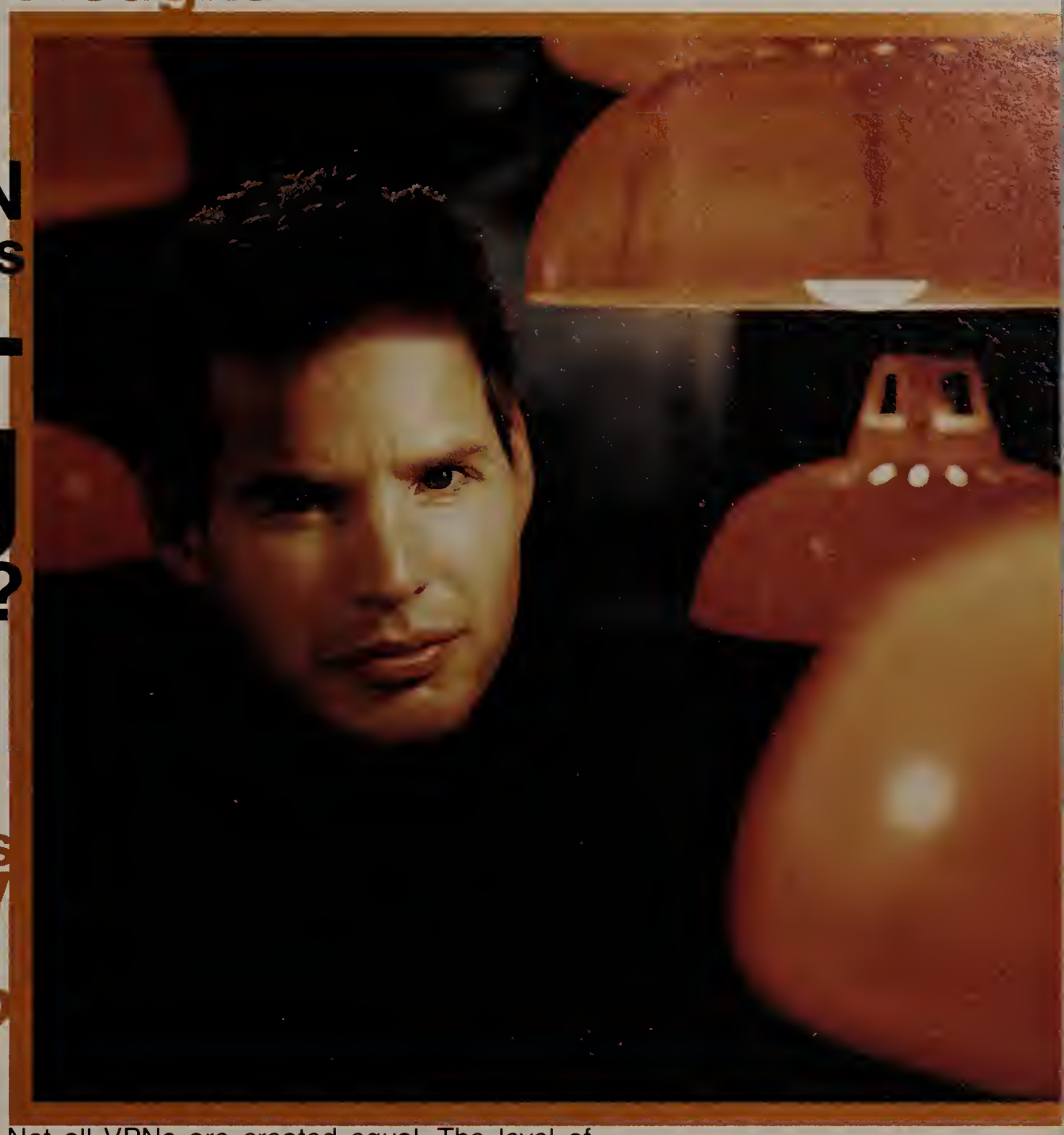
Novell: www.novell.com

WORLDCOM

today's business thought:

is your VPN built onto the world's farthest-reaching IP network?

or is security not your thing?



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*Based on global PoPs.

Lucent undergoing painful revamp

BY JIM DUFFY

Lucent's dire financial situation and wrenching restructuring will leave the company looking much different when the industry returns to solid footing.

Lucent, which last week posted a $1.89 billion third-quarter loss and plans to lay off another 15,000 to 20,000 workers, faces an uncertain future. If it survives, Lucent will be almost one-third the size it was a year ago. If it does not, it will be because the company was snapped up by a competitor coveting its huge installed base, Bell Labs research and innovation, and respectable product line.

But Lucent plans to stick around. It's set to implement Phase II of its restructuring plan, which is designed to return the company to profitability next year by reducing head count, expenses and product inventory.

Lucent has already reorganized into only two divisions — Mobility Solutions, which focuses on wireless, and Integrated Network Solutions, which deals with wireline.

And just as it did in its Phase I restructuring, which began in January, Lucent will sell only to the largest service providers.

"The biggest thing that Lucent has going for it right now is that it takes a lot [for telephone companies] to do anything different" in terms of switching suppliers, says Daniel Briere, CEO of Telechoice and a *Network World* columnist. "They're ordering from the same people they have. For them to move, they need to have a real compelling reason these days, because they're not trying to do stuff differently — they're trying to do stuff as cheaply and as efficiently as possible."

Briere says Lucent has not yet hit bottom, meaning there could be more downward pressure on revenue, earnings and stock price. Frank Dzubeck, president of Communications Network Architects and another *Network World* columnist, says Lucent has bottomed out.

"They're on the road to survivability," Dzubeck says. "Stockwise they've hit bottom. The first phase of the restructuring is nearly done. Lucent looks like they're achieving some state of stability."

It's been a long time coming. Lucent fortunes began to sour early last year when five straight quarters of disappointing results forced the ouster of then-CEO Rich McGinn last fall. Former Lucent chief Henry Schact was subsequently lured out of retirement to right the ship.

In January, Schact implemented Phase I of Lucent's restructuring, which sought to reduce expenses by $2 billion annually and improve cash flow. This would be achieved through layoffs, outsourced manufacturing, aggressive inventory management and generous lines of credit.

Schact last week announced plans for Phase II of Lucent's restructuring, which seeks to drive out an additional $2 billion in annual expenses.

Phase II is also designed to improve working capital performance by an additional $1 billion, reduce capital spending by an additional $750 million and cut staff.

Should Phase II be implemented — it is subject to amendments in the credit facilities Lucent secured in February to account for Phase II restructuring charges — Lucent will have reduced its workforce from 155,000 a year ago to 60,000 next year.

There's been some speculation Cisco could emerge as the "largest" telecom equipment supplier when Lucent and Nortel, another company posting huge losses and lopping off a huge chunk of its workforce, are finished restructuring. However, analysts are hesitant to call Cisco the winner by default in the telecom industry shake-up.

"I think Cisco's going to announce another round of layoffs" above and beyond the 8,500 already announced, says Kevin Mitchell, an analyst at Infonetics Research. "And there are some business units Cisco doesn't have, or areas Cisco is not playing in [in the service provider realm]," which limits the company's penetration into and ability to build relationships with service providers, he says.

Cisco declined to comment.

Cutting down to size

Staff downsizing by three major telecom vendors:

Lucent: 126,000 to almost 86,000, a decrease of 32%.

Nortel: 94,500 to 64,500, a decrease of 32%.

Cisco: 43,000 to 34,500, a decrease of 20%.

SOURCE: NETWORK WORLD 200 AND COMPANY DISCLOSURES.

Akamai, Reliacast partner to manage streaming content

BY JENNIFER MEARS

HERNDON, VA. — Content delivery network provider Akamai Technologies and software maker Reliacast are partnering to give corporate customers more control over streaming content.

Companies use content delivery networks, such as Akamai's system of more than 9,700 caching servers on 650 networks around the world, to speed the delivery of streaming audio and video. But identifying who receives the stream has been an inexact science. With Reliacast's software, customers can monitor and manage audiences by requiring authentication. Reliacast's software gauges the quality of the videostream when it is received at the desktop and collects audience data so customers can target broadcasts such as e-training to specific people or locations.

Reliacast uses a Java applet that is downloaded to the user's desktop. That applet checks for a "ticket" or requires the user to input information to get one. The ticket becomes a unique identifier for that particular viewer and collects information about the user. It also measures the quality of the download such as the speed of the connection and the number of packets dropped. The data are stored in an Oracle database collocated at a UUNET data center, and information can be integrated with customer relationship management and billing systems, says Bill Thornton, a Reliacast vice president.

"Our whole reason for being is that it's important to know who's on the end of the stream and to be able to use that information to help make intelligent decisions about how you make money [and] how you save money," Thornton says.

Analysts expect corporate use of streaming media to grow as technology improves and makes it easier to move large video files across the Internet. As the use of streaming media increases, the need to manage audiences will also grow.

Virtuebroadcasting, a London broadband streaming provider that has streamed Internet broadcasts such as Madonna concerts, uses Reliacast software to track and manage events. Sun, on the other hand, uses Reliacast to collect data about viewers of its eMedia Webcast series (see www.sun.com/media) so it can better target the content it provides.

Analysts say the partnership, which will be announced this week, gives Akamai customers the ability to do more things with streaming content, such as deliver pay-per-view concerts over the Web or run attendance-required e-training seminars. Akamai has provided the ability to monitor delivery, but not all the way to the desktop, they say.

"Now when it comes to content delivery, you can get the middle mile and the last mile in one alliance," says Michael Hoch, senior analyst with Aberdeen Group.

While other streaming vendors such as Lariat and MeasureCast provide audience data, and others such as Mindport and NDS limit access to streams, Reliacast may be the only vendor integrating all the pieces.

Reliacast: www.reliacast.com; Akamai: www.akamai.com

MILITARY ROOTS

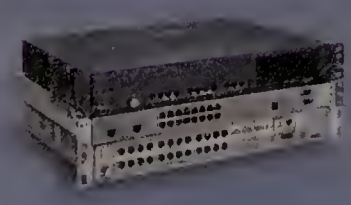
Reliacast's audience management software evolved from multicast protocol work done for the Department of Defense. James McNabb, now Reliacast's CTO, and Alfred Weaver, now a computer science professor at the University of Virginia, built software to monitor the delivery of content such as battlefield command and control, and satellite imagery to a mass audience. The software authenticated the user and monitored what content was received and when it was received. "So they have records of the last time they got updated data and did they receive that data and, probably more importantly for battlefield platforms, are they even there in the first place," says Bill Thornton, a Reliacast vice president.

— Jennifer Mears

Telephone systems

Portable PCs

Servers



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Role-based access control on a roll

Big users, such as Chevron, are developing advanced systems to control resource access.

BY ELLEN MESSMER

SAN DIEGO — Provisioning network and application resources for employees can be a time-consuming task, but large corporations are starting to simplify the process by centralizing network user information and assigning users to role-based groups.

Chevron, Anthem Blue Cross/Blue Shield and State Farm Insurance are among the companies taking steps to do this by investing in commercial software or developing systems internally. By working with upper management, in particular the human resources department, to assign each employee at least one "role," such as sales or engineering, the process of granting or terminating predefined network privileges promises to become more automated and much faster.

"We need to ease the burden on IT managers," said David Everett, a systems specialist who detailed how Chevron is moving to role-based access control in the presentation he gave at last week's Catalyst Conference, an event put on by The Burton Group. Chevron will use Business Layers' Day One software, which can take input directly from human resources applications to generate requests for new user accounts for application resource access.

As part of a workflow process that involves approving the new user for certain mail or server resources across Chevron's intranet, the Business Layers software will send an instruction to a separate repository — in this case, an IBM SecureWay Meta-Directory — to activate accounts at Windows NT, Exchange or Lotus Notes servers. For the first time, those accounts will be defined by assigning the user to a "role" that assumes people with different jobs can be neatly assigned predetermined types of access based on business need.

"It takes a long time to get users provisioned, and we see role-based access control as a real productivity enhancement," Everett said. Chevron will start testing the process this fall at its lubricants division with help from systems integrator ePresence.

Meanwhile, Anthem has already begun implementing role-based access control using OpenNetworks' Directory Smart provisioning software in conjunction with Microsoft's Active Directory (see www.nwfusion.com, DocFinder: 5355).

Anthem will use role-based access control for 13,000 internal end users and to put corporate business partners, such as contractors or trading partners, into specific groups defined for network access. Anthem sees automation of end-user provisioning on its intranet as crucial to meeting tough new data security guidelines outlined by the federal government.

The move to centralized role-based user access control has brought about the need for new and more coordinated efforts with the Anthem human resources department, which has put restrictions on how far IT can go with its role-based assignment system, said John Reynolds, director and technical architect for e-commerce. The human resources department has a strong sense that it "owns" this employee data, he said, and it took Anthem's IT department some time to convince human resources that combining data from across Anthem's offices into one metadirectory was acceptable.

One drawback to role-based access-control systems is that they can be expensive, Reynolds said. It's costing Anthem $400,000 for the enterprise license for Microsoft's Active Directory alone, although that is far less than the $4 million Novell wanted to charge based on per-entry pricing to use its eDirectory, he said.

In fact, cost played a role in the decision by another insurer — State Farm — to design its own technology for handling role-based access control before venturing into commercial software and beyond pilot tests. State Farm is looking at an automated access-control system for the company's more than 75,000 employees and agents, said Neal Shah, a security specialist with the company.

Cost has to be a concern because the typical price for role-based provisioning software, such as that from competitors such as Business Layers and Access360, runs from $600,000 to $800,000, said Christy Hudgins, an analyst with The Burton Group.

Another obvious problem with these new systems, she noted, is that some individuals are just not going to fit neatly into "roles" and have to be assigned as exceptions.

As customer interest in these new access-control systems increases, more vendors are responding.

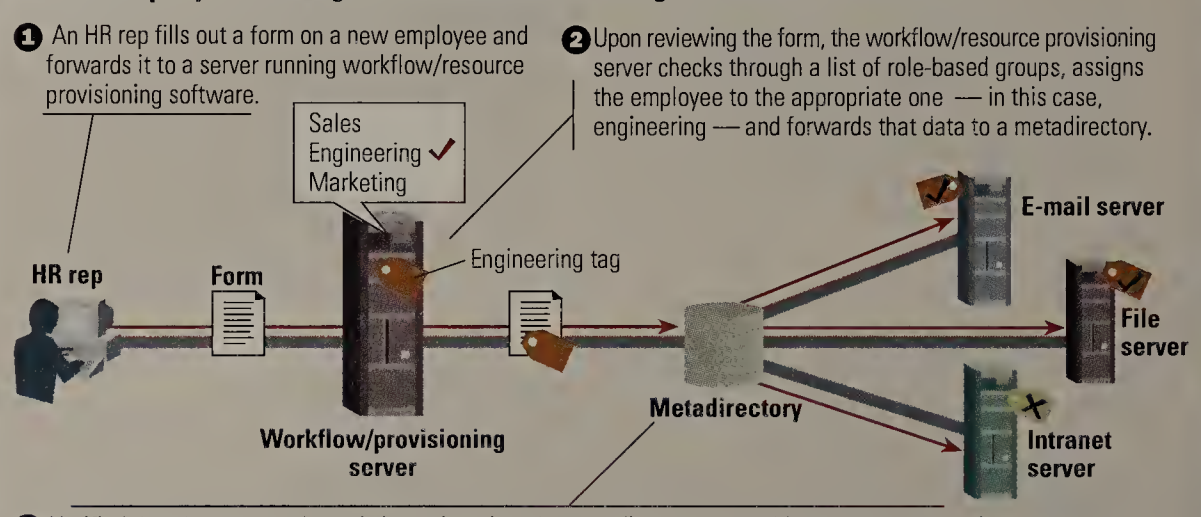
Siemens and iPlanet last week separately announced that their online directory products will support role-based access control. Siemens is the first to build its directory on a role-based specification developed by the National Institute of Standards and Technology. iPlanet will have a beta version of role-based access in its iPlanet Directory in a few weeks.

Microsoft and Sun will add role-based access-control support in their operating systems.

Role-based access control is still an experimental idea for commercial systems, though the Defense Department developed something similar in trusted operating systems more than a decade ago. But with customer interest now on the rise, software vendors are hoping it's an idea whose time has come. ◪

Role play

How a company can manage network resources using role-based access control:



Corrections

A graphic on page 25 of the July 23 issue of *Network World* misidentified the title for CoreExpress founder David Barmann. He is principal scientist, switching systems, for the company.

INDUSTRY POSEURS EXPOSED.

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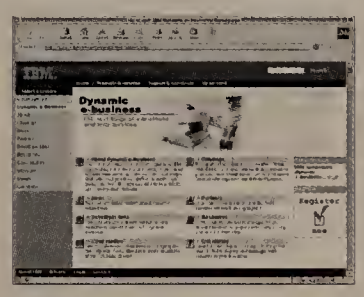

CODERNAUTS LEARNED MORE ONLINE.

For instance, a moving company facing the problem of keeping its trucks full during the entire cyele of the transport, as in return trips during eross-eountry moves, can now utilize Web services enabled by IBM software to seamlessly locate, book and manage new eustomers.

Another ease is a travel, leisure and entertainment company. The challenge? Link hundreds of applications together to form a one-stop Web portal that provides relevant information and offerings to customers. The result? Expanded services at dramatically reduced eosts.

Presently, there are a number of software vendors trying to sell their proprietary technologies as ways to enable Web services.

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Hate,
continued from page 1

end users operate on a different level, says Dave, a public relations professional in Massachusetts. He equates them to athletes-turned-coaches: "Good athletes sometimes have a hard time coaching because they don't understand people who aren't as good or don't hustle as much as they did."

The same is true of IT people who assume their users know more than they really do.

Tom, a Washington, D.C., architect, adds that age can be a factor in the communication gap. "The biggest complaint I have is that the IT guys are in their mid-20s. We old farts who didn't grow up with PCs in our homes and took PASCAL and FORTRAN and Lotus 1-2-3 have a difficult time understanding what they're talking about half the time," he says.

❷ Customer disservice

Customer service is not just about helping external clients — for the IT department, its customers are internal.

"Our IT department has never heard of customer service," says an account executive at an insurance agency in Denver. "I'm amazed at their total lack of recognition of the fact that without us out bringing in new business and retaining the clients we have [through superior customer service], they would not even have jobs. Not to mention, they are too important to ever answer their phone."

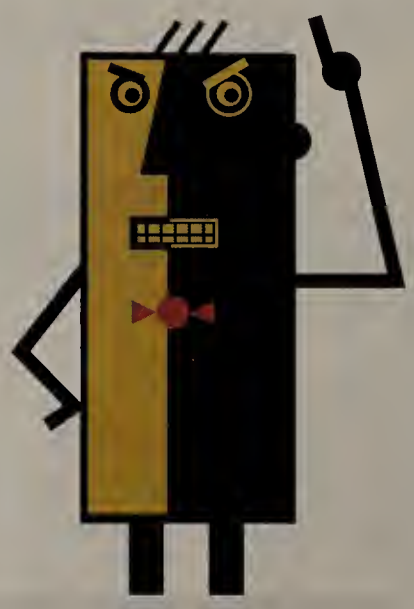
❸ Service interruptus

A public defender in Nebraska says that having one IT group for the entire county means sometimes the IT technician who started to fix a problem isn't around to finish it.

"When I call back and ask to speak to the same tech, I am informed that the person is somewhere else, that the techs are not assigned to specific offices, and that the first available person will be sent," she says. "While I appreciate the effort at quick response time, the new tech inevitably shows up while I am out of the office so I can't fill them in on the problem or the attempts at fixing it. Sometimes I can't even explain what the other tech attempted to do. I wish there was better information sharing within our information services or that the techs would be assigned to particular offices."

❹ Covert missions

The IT department rarely explains exactly what it's doing or why, unless asked, says Philadelphia architect Richard Killeen. The IT group at his firm planned to run an audit of each user's PC a few months ago, he says. "This was prefaced by a brief e-mail describing how they would be coming to each station to perform an audit. Period. Now, since I associate the word 'audit' with something pretty bad [i.e. taxes], I panicked and called the helpline for more information."



Killeen learned the audit is a fairly routine procedure — not a mission to expose his Web-surfing habits or personal e-mail discussions. But he had to make a phone call to find out, when it would have been so easy for IT to have added a sentence to the e-mail describing the procedure.

❺ Impatience

Yes, users don't follow instructions. Yes, they repeat their mistakes. And yes, they even ask stupid questions. User Joe acknowledges that when questions are low-level, easy stuff, IT people may feel they are wasting their time. "I guess that probably leads to the inevitable bad attitude and condescension toward staff," he says.

Joe's suggestion? "IT people should have an unbelievable amount of patience, much more than typical people — and to keep in mind that even though they're dealing with morons, they should keep it a private joke from other staff," he says.

❻ Inability to admit defeat

"I don't always feel confident that the IT person has a clue what to do or will tell me honestly if they don't. I really like it when one of them says, 'You know what? I don't know. Let me check and get back with you.' That's what I tell clients when they ask a question I don't know the answer to," says David, a Virginia lawyer.

When IT staff insists on forging ahead in unknown territory, the result can be "half-baked solutions," he says. For example, when his firm upgraded Microsoft Outlook, a subfolder of his contacts was omitted from the message creation field. "So I asked how to get it back, and she just fiddled around and ended up dumping all those from the subfolder into the main contact folder," he says. "Oh, thanks a bunch. Now my college buddies and car detailer are listed in the general contact list, which incidentally is linked through interaction to a general firmwide list. That's obviously not what I was looking for. She tells me I can hide them from interaction but that's not the point. That's just how she figured out to get the job done, instead of doing the real job."

❼ Inflexibility

A naval officer on a U.S. aircraft carrier complained about controls from above that restricted how he could customize his desktop. Adding a shortcut was about all he could do, he says. "Everything else pretty much required administrator privileges. . . . It's ridiculous."

❽ Slow on the uptake

Problems happen, sure, but IT needs to understand that employees simply want to get back to business. That means getting a quick fix or knowing what the issue is so they can work around it, says Sue, an account executive at an insurance firm in Denver.

"We have had several instances where our e-mail functionality, an extremely important tool in our daily contact with clients, has gone down, without our knowledge, and our clients did not receive e-mails sent for periods of up to five days before we were notified. This, as you can imagine, led to several deadlines not being met and caused our clients to doubt our ability to get the job done," she says. "When the help desk is called to assist with an IT issue, they are extremely slow to respond and seemingly unaware or apathetic toward the urgent deadlines that we must meet." ◪

MAKING THE IT DEPARTMENT (INTERNAL) USER-FRIENDLY

As IT departments evolve into integral parts of day-to-day business operations, IT managers may find that their most important clients work right down the hall.

"Most people change the way they focus on client service for an external client vs. an internal client and that's a big mistake," says Kevin Volpe, group vice president of client care for Gartner. "After all, the productivity loss of an internal client can negatively impact an external client."

For years, IT had little contact with most employees, focusing more on keeping business systems up and running. But today, with nearly all employees using network-linked desktops, laptops or wireless devices, the demand for internal customer support is growing.

"It really is changing a culture because you have to take it from a technically driven environment to a customer service-driven environment," Volpe says. "That doesn't mean you abort the technology side altogether. It means you have to incorporate customer-service skills into technically proficient people."

Gartner uses service-level recognition awards to encourage IT people to shine in customer service and hosts monthly brown-bag lunches to keep end users educated about what IT is doing.

Hunter Muller, principal at Hunter Management Group in Westport, Conn., says IT departments should set internal service-level expectations and then measure themselves against those standards. For example, IT managers can track how long it takes to respond to internal problems and then gauge end-user satisfaction.

In addition, by tracking problems, repeated complaints can be identified. "Develop a list of frequently asked questions and put them, and the solutions, on a Web site so end users can solve problems on their own," says Peter Urban, a senior research analyst at AMR Research.

Perhaps the most important thing the IT department can do, says Chris Gardner, a partner in the IT strategy consulting practice at PricewaterhouseCoopers, is to "transition the department from being a cost center to being a value center."

"T needs to take the initiative more and anticipate user needs, both in terms of where the business is going and where the technology is going," he says.

— Ann Sullivan and Jennifer Mears

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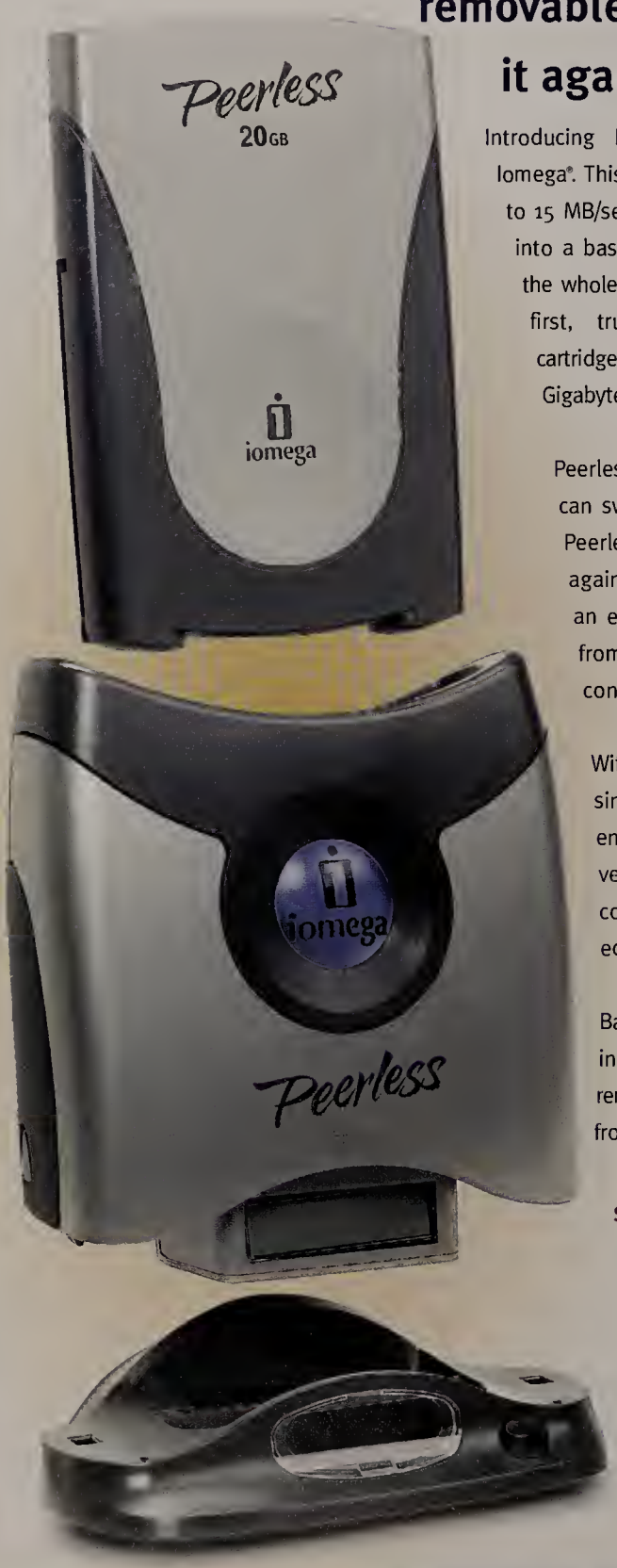

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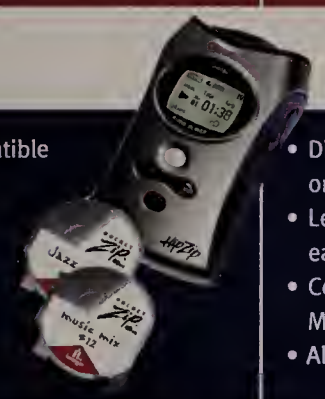

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Zip® 100 $79.95***				Up to 100MB capacity Up to 1.4MB/second					
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Zip® 250 Bay Tray $229.95				Up to 250MB capacity Up to 2.4MB/second	Up to 250MB capacity Up to 2.4MB/second				
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Briefs

Microsoft last week expanded its Windows CE source code sharing effort, giving users and software developers more access to Version 3.0 of the CE operating system, designed to run on small computing devices. Microsoft opened up parts of the CE code last June, when the company launched its latest version of the compact operating system. Previously, users could purchase a CD and look at portions of the CE 3.0 code in read-only mode to get a better understanding of how it worked and how to write applications for it. A Microsoft Web site posting shows the company has broadened this effort by letting users download parts of the code and experiment with making changes to the software. The download program is governed by Microsoft's Shared Source License, which lets users make changes to the code for noncommercial purposes.

Microsoft: www.microsoft.com/windows/embedded/ce/tools/source/default.asp

BEA Systems has partnered with **Intel** to develop a version of its application server software that runs on Intel's 64-bit Itanium processor. The move should lower the price for customers who want to use BEA's software. BEA's application server, called WebLogic, already runs on Intel's 32-bit Pentium III Xeon processors, but limits on how far those chips can scale mean few customers deploy the software on Intel-based servers. Instead, most run it on more powerful servers from the likes of Sun and Hewlett-Packard. Intel's Itanium chip is designed to change that. Its 64-bit architecture lets it address the large amount of memory associated with enterprise applications, and it can scale to build more powerful servers.

BEA: www.bea.com; Intel: www.intel.com

Nortel's Alteon play gets mixed results

A year after purchasing Alteon WebSystems, Nortel needs to refocus on enterprise customers.

BY PHIL HOCHMUTH

When Nortel bought Alteon WebSystems a year ago, the company made a $7.8 billion bet that service providers would continue to gobble new equipment and technologies such as Web switching. Now that carrier spending has dried up and the economy has gotten sour, analysts say Nortel may look to peddle its Web switching wares more to enterprise customers.

Observers say the purchase was a positive step because it added Web switching — a "next big thing" technology — to Nortel's product portfolio. The move was also an attempt to keep pace with rival Cisco, which purchased Web switch maker ArrowPoint Communications for $5.7 billion two months before the Nortel/Alteon deal.

Overall, the Alteon purchase got Nortel close to where it wanted to be — the top of the Layer 4 to 7 switch market. Cisco was the market leader last year, with 45.9% of the $251 million worldwide Layer 4 to 7 switch market, with Alteon coming in second at 20.6%, according to market research firm IDC.

But with the negative turn in the service provider market, both companies may have to get creative to make their Web switch bets pay off, says Joel Conover, senior analyst with Current Analysis.

"Nortel paid a lot of money for [Alteon], and it's probably going to take more time than they expected to pay off that investment," he says.

Conover adds that enterprise users

Alteon's ACEDirector has become part of Nortel's Personal Internet family.

were not first and foremost on Nortel's mind when it bought Alteon, which is why the deal hasn't been that significant for many Nortel enterprise customers.

One such shop is Domino's Pizza. While Domino's uses Accelar (now PassPort) and BayStack switches to provide Gigabit Ethernet and quality of service in its LAN, Layer 4 to 7 switching technology has not yet figured into the firm's LAN or WAN plans, says Matt Maguire, director of IT for the Ann Arbor, Mich., company.

Conover anticipates this type of mentality will change among enterprise users as Nortel shifts its focus from a market that's stagnant to one that's growing moderately.

"Demand from the enterprise side is growing, while service provider demand is kind of steady. That's why a lot of companies are turning an eye toward the enterprise," Conover adds.

The Alteon acquisition has also had little impact on Alteon user VeriSign, which uses the vendor's ACEDirector switches

See **Nortel**, page 18

Palm bolsters processing power

BY JOHN COX

SANTA CLARA — Palm's decision to license part of its widely used operating system to chip makers is the latest step in making Palm OS a serious contender for next-generation handheld computers.

Enterprise network managers can expect sometime next year to see a variety of handhelds from Palm and licensees such as Handspring, IBM and Sony that can use the powerful microprocessors based on chip designs licensed from ARM. These microprocessors can run bigger applications and easily handle graphical, audio and video files.

"It's a great move," says Martin Reynolds, a research fellow at Gartner. "The [current] Palm processor has been around for five years and hasn't really gone anywhere. At the same time, the ARM is becoming ubiquitous and Microsoft has indicated it is the processor of its choice. I expect all handheld platforms to come together on ARM."

Chip makers Intel, Motorola and Texas Instruments have licensed Palm's new Silicon Porting Kit, a development tool that these companies can use to fine tune their microprocessors, most of them initially based on the ARM microprocessor core, to work closely with the Palm software.

Chip makers will be able to create a range of new features that exploit specific parts of Palm OS, so device manufacturers will have a greater selection of much more powerful microprocessors, with a greater range of capabilities and prices, than they have today.

In turn, the manufacturers will be able to create new devices using these chips more quickly, easily and therefore more affordably than before.

Currently, Palm devices use the Motorola 68000-based DragonBall processor. Palm announced last year it was porting Palm OS to the ARM architecture, which is highly regarded for its processing power, compactness and low electrical demands.

Palm emphasizes its operating system and applications based on it are simple and easy to use. But open source Linux, ported to handhelds, and archrival Microsoft, with its PocketPC version of the Windows CE operating system, are making inroads in the enterprise market, according to analysts. These alternatives are full-featured operating systems that can surpass the current Palm OS 4.1 ver-

See **Palm**, page 18

Wired Windows . Dave Kearns

WITH OPERATING SYSTEMS, MONOGAMY IS OVERRATED

Have you seen the new Sun ad? The one with a picture of four feet sticking out from under a sheet on a bed with the word "monogamy" superimposed in large letters? The subhead reads "Operating systems are like spouses. If you have more than one, things get complicated."

Their point is that — unlike competitors Hewlett-Packard and IBM — Sun only supports one operating environment (Solaris), so it can concentrate all its effort on bringing the best management, applications and cost to that single environment while still scaling to meet all your needs.

Unfortunately, Sun leaves itself open to a lot of backroom guffawing and snickering as competitors attack the premise.

Because there is no Solaris operating system for handhelds (such as iPaq) but there is a Windows operating system (Windows CE) for them, should you throw out all your Solaris systems because the marketing department wants to carry iPaqs? That is, should you swap your Sun Enterprise 10000s for a bank or two of Windows 2000 data center servers so you can maintain a monogamous relationship with your operating system vendor?

Thirty years ago, it might have made sense for IBM to argue that only by maintaining a homogeneous environment in hardware, operating system and applications could you successfully integrate all corporate computing functions. But that day is long gone. No one has "best of breed" in all categories or even comes close. And your company's competitors are looking at "best of breed" solutions, so talking about saving a few bucks by tying all your computing needs to one company while the competition is beating you will not, at the end of the day, endear you to corporate management.

But then, the whole subject of operating systems is so last century. The net and the directory are today's computing platforms. The operating system a particular system runs is simply dictated by the applications you want to have available. And, significantly, there are quite a few different directory services that can run on a Solaris platform (iPlanet, eDirectory, OpenLDAP, etc.).

As a friend in Provo, Utah, put it — paraphrasing the punch line from the ad — "Operating systems are like spouses, the more you support the better off you are." While he spoke in jest (or, maybe not) his point is very true.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of The Week

I was very impressed with Caldera's Volution product, the first directory-enabled management solution for Linux systems. See this week's Focus on Directory Services newsletter for more detail, or visit www.caldera.com for information and an evaluation version. If you're running just about any Linux distribution, you need to take a look.

Hewlett-Packard set to tap IP-based storage market

BY ASHLEE VANCE

Hewlett-Packard last week said that early next year it would begin shipping a variety of storage products centered around the emerging iSCSI standard for linking data storage systems over IP.

Many companies currently rely on Fibre Channel or SCSI technology for sending information between storage devices and servers in a storage-area network (SAN) environment. However, The iSCSI standard has garnered industrywide support and should create more options for users looking to link storage boxes with servers.

The introduction of the iSCSI standard lets storage devices connect to existing IP networks, making more information available to more parts of the network. The use of iSCSI also makes it easier for administrators to manage their SAN systems remotely.

HP will not abandon its Fibre Channel business any time soon, but the vendor plans to launch an iSCSI assault early next year, hoping to attract customers who have yet to decide how they will move from a direct-attached to a networked storage architecture.

HP acknowledges some customers will always feel comfortable dealing with Fibre Channel and will tend to embrace improvements made with Fibre Channel over IP instead of adopting iSCSI. But the company says users' familiarity with IP and, in particular, Ethernet technology, should make iSCSI products attractive.

Work is still under way to refine Version 1 of the iSCSI specification and make it available by December this year or January 2002. However, the lack of a finished specification didn't stop IBM from announcing one of the first iSCSI products earlier this year — the IP Storage 200i appliance.

HP claims its broad product line can compete with top-tier storage vendors such as IBM and EMC and at the same time go up against low-cost storage players such as Dell.

Vance is a correspondent with IDG News Services' San Francisco bureau.

Palm,
continued from page 17

to load balance its 128 Web servers. The digital certificate authority has had no problems with Nortel, other than a few instances of getting the runaround while looking for phone support from Nortel/Alteon, says Anand Valmiki, network manager for the company's Web site. Valmiki adds that while his company is now technically a Nortel customer, he will stick mostly with the Alteon products, because most of the firm's internal network runs on Cisco equipment.

Putting the pieces together

During the past year, Nortel has rolled the Alteon technology into its Personal Internet product line, which includes content delivery network equipment such as Web switches, caches and Secure Sockets Layer acceleration gear. These products are a mix of original Alteon boxes, such as the ACEDirector and ACESwitch load balancing and applications switches, and products from Novell caching spinoff Volera.

The most significant integration of Alteon/Nortel equipment came with the Alteon 780 series, which was based on Nortel's PassPort 8600 Layer 3 switch for large companies and service providers. The switch combines the PassPort's 10-slot chassis and multigigabit backplane and Web switching technology from Alteon to form a behemoth Web switch aimed at customers such as application service providers and large enterprise data centers. Nortel beat Cisco to the punch in putting Layer 4 to 7 switching into its top backbone switch, as Cisco's Web switching module for the Catalyst 6500 came out three months after the Alteon 780 was announced.

"I think Nortel has done a good job integrating Alteon technology across their product offerings," Current Analysis' Conover says. "That's their whole CDN play. However, I think they have slowed down a bit since those products were introduced." Conover attributes this to a market slowdown, but adds that he expects to see more Alteon/Nortel technology integration for enterprise products down the road.◪

Palm,
continued from page 17

sion in features such as addressable memory.

ARM processors, based on technology from ARM, already power devices that compete with Palm's handhelds. Compaq uses Intel's StrongARM processor for its iPaq Pocket PCs.

"The performance [of ARM] is drastically greater [than DragonBall]," Gartner's Reynolds says. "The processor is powerful enough to run all of the existing Palm applications through emulation. Palm has to do something, especially in the corporate market where it is losing ground to Microsoft and the Pocket PC."

Much of the work in moving Palm OS to ARM involves creating this software emulator, says Pam Deziel, director of product marketing for Palm's Platform Solutions Group. The plan is that existing applications, written to Palm APIs and coding conventions, will be able to run unchanged on the ARM processor through the emulator, which will mimic some of the DragonBall functions.

Joris Evers, a correspondent with IDG News Services' Amsterdam bureau, contributed to this story.

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Briefs

XO Communications recently announced a dedicated wavelength service that lets users set up high-speed network connections. Customers and other service providers can buy XO's **Metro Wavelength Service** in three speeds: 622M bit/sec, 2.5G bit/sec and 10G bit/sec. The service is available in the 62 markets where XO offers local services over its dense wave division multiplexing fiber-optic network. Customers who sign up for 622M bit/sec of bandwidth will pay $12 to $19 per month, per megabit.

XO: www.xo.com

Sprint has added a new element to its service-level agreement for its dedicated Internet access customers. The service provider now guarantees customers will not sustain more than .3% packet loss across Sprint's network. This is the strongest minimum packet-loss guarantee available. If Sprint does not meet its SLA, users receive a credit equal to 10% of their monthly charges. The service provider also offers a 100% network availability guarantee when Sprint provisions a customer's local loop connection over one of its local networks.

Sprint: www.sprint.com

Qualcomm is being restructured into two groups, and the company withdrew plans to spin off its semiconductor business. Under the new plan, Qualcomm will consist of two groups: Wireless & Internet Group and CDMA Technologies Group.

Qualcomm's board of directors also approved the appointment of **Anthony Thornley** as COO. Thornley will replace Richard Sulpizio, who resigned last week from his position of COO, but opted to remain on the board of directors.

Qualcomm: www.qualcomm.com

DSL Forum: Profitability around the corner

Advocacy organization says growing installed base, improved technologies will boost DSL.

NetworkWorld Q&A

DSL providers and equipment suppliers have been in the news a lot lately. Unfortunately, the news hasn't been good. Network World *Senior Writer Michael Martin recently spoke with Bill Rody, head of the DSL Forum, a nonprofit group that promotes DSL technology.*

What is the role of the DSL forum?

We're an industry advocacy group that is organized under the antitrust law, and we come together to advance the cause of DSL and try to remove any obstacles to the mass marketing of DSL services and products.

How would you describe the state of DSL right now?

DSL is experiencing strong growth in spite of the general turndown in the telecommunications market. We just ended a quarter where we managed to double the installed base in the last six months. We're seeing a very aggressive deployment happening globally. We now have an installed base of more than 10 million global customers. So we're very encouraged by what's going on.

How much has the reputation of DSL as a technology been damaged by the problems of competitive local exchange carriers [CLEC]?

It goes without argument that some members of the financial community have been looking at DSL with a harsh eye because of the failure of a few high-profile data CLECs. But the fact is that incumbents and CLECs are offering DSL and are still having trouble keeping up with the demand. We're seeing penetration all over the U.S. For example, SBC is putting in more than 14,000 new DSL customers every week. So I would say that some of the bad press we've had in the financial community will turn around as soon as they start seeing the profits show up in some of the [independent local exchange carriers] and CLECs.

When do you think they might start seeing those profits?

Immediately. You'll also see some ser-

See **Rody**, page 24

Road to 3G begins in Seattle for AT&T Wireless

Faster service won't be available nationwide until end of 2002.

BY DENISE PAPPALARDO

AT&T Wireless is beginning to offer faster wireless data speeds on its network, but only a minority of U.S. customers will see the benefits within the next year.

AT&T Wireless currently has a national Time Division Multiple Access (TDMA) network. It announced last year that it would build an overlay network using Global Systems for Mobile communication (GSM) and General Packet Radio Service (GPRS) technologies on its road to 3G wireless support.

The wireless service provider, which spun off from AT&T earlier this month, has completed that overlay network in Seattle. The new technology lets users access the Internet and send e-mail and text messages at 30K bit/sec to 40K bit/sec.

AT&T Wireless expects it will have GPRS built over 40% of its network by year-end, with 100% completed by the end of 2002.

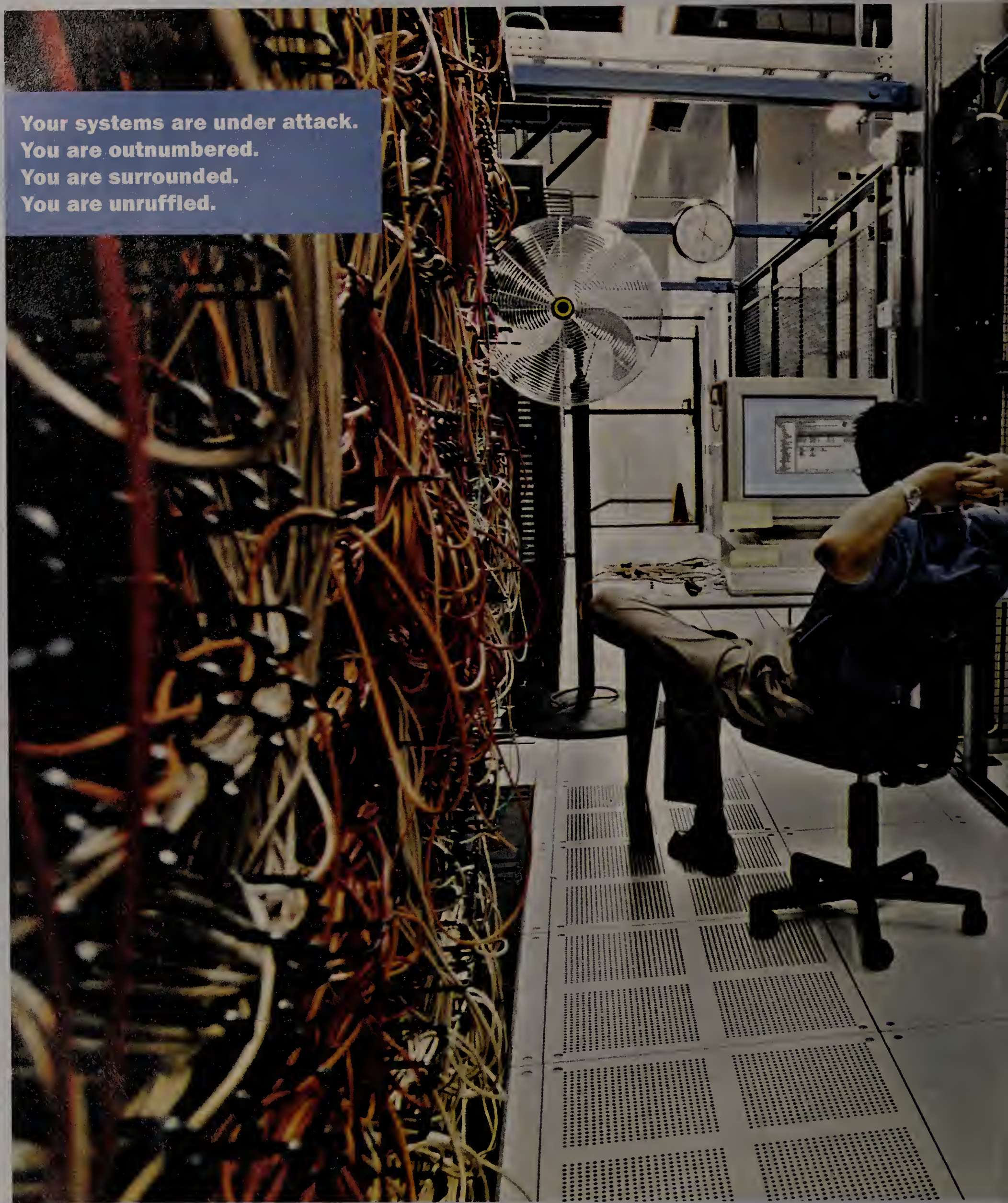
The GPRS upgrade increases wireless data speeds two to three times compared with what's available from other wireless service providers. While slower than the standard 56K bit/sec wireline modem, AT&T Wireless service is an improvement over the fastest wireless voice and data services that max out at 14.4K bit/sec.

The AT&T Wireless GPRS upgrade is considered a 2.5G technology. AT&T will upgrade to GSM Enhanced Data rates for GSM Evolution sometime next year, which will support 3G wireless data speeds of at least 144K bit/sec.

AT&T chose GSM because it is the world's dominant next-generation wireless technology. Ira Brodsky, president of DataComm Research, says GPRS will be more successful than initial Code Division Multiple Access 2000 (CDMA2000) deployments by competitors such as Sprint PCS and Verizon Wireless. These wireless service providers have CDMA networks in place.

But Brodsky says AT&T Wireless chose the wrong technology.

See **AT&T Wireless**, page 24



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Eye on the carriers . Johna Till Johnson

WHY MPLS MATTERS IN CARRIER NETWORKS

Unless you've been pulling a Rip Van Winkle for the past 18 months, you've noticed that Multiprotocol Label Switching has become the technology du jour.

Virtually every major provider either has deployed it or has plans to do so. There are books and conferences devoted to the technology. So what's all the fuss about? From a user perspective, mighty little.

MPLS offers basically the same thing available previously from technologies such as ATM and frame relay: relatively reliable and secure transport across the WAN. However, to service providers, MPLS promises increased control, simplicity and manageability.

To understand what MPLS does and does not accomplish, you need to step back and revisit data networking architectural principles. One of the biggest challenges in building a network lies in ensuring traffic has enough bandwidth to get from point A to point B. In the old days before IP, network managers solved this problem by engineering the network to support anticipated traffic flows — a process called, naturally enough, traffic engineering. In this model, all the routing intelligence happened outside the switching fabric, in complex modeling software or engineering craniums. Engineers told the switches where the traffic should go, and the switches obeyed.

However, the paradigm shift introduced by IP is that the network (more specifically, the routing elements that forward the traffic) figures out the best path across the network. In essence, routers do traffic engineering.

This approach has many strengths but also major weaknesses. When networks get too large, discovering and selecting routes becomes slow, awkward and ineffective. For this reason, by the late 1990s, most large ISPs had created two-tier architectures, with an outer ring of intelligent routers communicating across a switched (typically ATM) core, implementing traffic engineering at the core.

There are two problems with this approach. First is the well known "cell tax," the bandwidth overhead resulting from segmenting large IP packets into 53-byte ATM cells. In addition, service providers must manage and administer multiple networks of devices (optical transmission, ATM switching and IP routing).

MPLS addresses both problems. In essence, it provides for ATM-like traffic engineering across an all-IP backbone, eliminating the cell tax and reducing the number of networks that must be managed — both net gains for service providers. Additionally, MPLS by design does not interfere with user address space. This means that, unlike in a "pure" routed IP network, users can maintain their addresses, even using private (net10) addresses. Again, this feature was and is available over a frame relay or ATM network; the difference in this case is that it's available across an IP one.

All that said, MPLS isn't a complete panacea. Ensuring the scalability and security of MPLS networks is something of a black art, requiring sophisticated network design. But overall, MPLS gives service providers increased control over their networks — and that can only translate to better service quality for users.

Johnson is senior vice president and CTO for Greenwich Technology Partners, a network consulting and engineering firm. She can be reached at johna@greenwichtech.com.

Rody,
continued from page 21

vices offered, which will help push the revenues. In the next year you'll see voice over DSL, you'll see videoconferencing come back, and we will see video on demand blazing back into the DSL space.

How is DSL faring in comparison to cable and broadband wireless services?

Globally, DSL is running ahead of competitors in a month-by-month installed-base comparison. In the U.S., it's been a tough race between cable and DSL. DSL started a little over a year late and has been trying to catch up ever since. We're very encouraged by some of the installation rates that are beginning to happen. Down the road I think wireless broadband delivery systems could become an excellent way to get broadband service. I don't think they are today, but in the future as some of the technology become more stable and they figure out how to get some better upstream bandwidth, I think it could become a serious threat.

Are there new DSL standards or technologies we should be keeping our eyes open for?

Most recently we have published technical reports on flow-through provisioning, on autoconfiguration and on [Common Object Request Broker Architecture]. . . . We've published reports that show telephone companies how to install DSL faster and move towards a retail-market model as interoperability efforts begin to incorporate some of these recommendations.

Also, the [International Telecommunications Union] has standardized on synchronous high-speed DSL, and it's rapidly moving through the ANSI standards process. At DSL Forum, we have a working group, and we are looking at bringing end-to-end [symmetrical high-density DSL] networks into play that will unlock the in-home business.

When do you think we might see SHDSL out there in a big way?

There will be trials through the balance of this year with deployment starting next year.

What do you think it will take to get DSL to the point where it is a mass-market technology that consumers can just go and buy from Radio Shack?

We really need to have the world's suppliers come together and produce interoperable products. That way you could go to your local consumer electronics store and just like you use a dial-up modem, you'd be able to use a DSL modem. There's work to be done, but based on what we hear from our membership, they're supporting this.

But this isn't on the horizon?

I wouldn't promise it for this Christmas, but certainly great strides are being made. On a regional basis, interoperability is happening. On a national basis, there's still work to do. ◪

Driving DSL forward

Some facts on the DSL Forum:

- **Members:** More than 400, including equipment suppliers and service providers.
- **Goal:** To help DSL become a mass market technology.
- **Tasks:** Interoperability testing and providing input to standards bodies.

AT&T Wireless,
continued from page 21

"GPRS/GSM requires a new radio network and a new core network, so this is going to be a very expensive move," he says.

AT&T Wireless is spending $5 billion to upgrade its TDMA network this year.

Users have to buy a new phone, which will only work in Seattle today. Dual-mode phones that support TDMA and GSM/GPRS are not available. Users will also receive separate bills if they use both AT&T Wireless services.

Although AT&T Wireless is offering a faster service, it soon will have stiff competition from Sprint PCS and Verizon Wireless. Both service providers are upgrading their networks with CDMA2000, which will support data transmission speeds of 70K bit/sec to 150K bit/sec.

Verizon Wireless promises 3G upgrades in the fourth quarter in a few cities, which it would not name. Sprint PCS says it too will have a few cities upgraded to the faster wireless service by year-end. Sprint PCS also promises nationwide 3G support by mid-2002. Neither provider could share details about pricing or service packages.

AT&T Wireless Mobile Internet service is available in five packages, starting at $50 per month. The basic package includes 400 voice minutes. A 2000-minute package costs $160 per month.

"GPRS/GSM requires a new radio network and a new core network, so this is going to be a very expensive move."

Ira Brodsky,
President,
DataComm Research

All the packages include 1MB of data transmissions per month. Users pay $.0075 for every kilobyte beyond the first megabyte.

Users also must purchase a Motorola Timeport handset for $200.

AT&T Wireless www.attws.com.

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Briefs

Optical Ethernet start-up **Atrica** last week announced that former Redback Networks CEO **Vivek Ragavan** had been named president and CEO.

Ragavan, who also headed Siara Systems and sold the company to Redback for $4.5 billion, replaces Atrica founding CEO Avinoam Rubinstain. Rubinstain will become Atrica's CTO and senior vice president of product development and supply-chain management.

In addition to Redback and Siara, Ragavan's 20-year industry tenure included executive roles at ADC Telecom, Comsat and General Instrument.

Atrica: www.atrica.com

Operations support system software start-up **BayPackets** has named a president and CEO, and announced $19.5 million in new funding.

Ken Epps has been recruited from William Communications to head BayPackets. At Williams, he was senior vice president and chief marketing officer.

Lucent Venture Partners led Series B financing. BayPackets has raised $24 million and plans to launch its products later this quarter.

BayPackets: www.baypackets.com

Two other OSS software vendors, **Narus** and **Xacct**, recently announced deals.

Narus has an agreement with Nokia to collaborate on **Global Packet Radio Systems** and **3G** wireless management products to be marketed by Nokia.

Xacct announced that Canadian service provider Telus has selected Xacct's Network-to-Business back-office software for usage-based billing of IP services.

Narus: www.narus.com; Xacct: www.xacct.com

Sycamore boosts SN 10000 features

BY TIM GREENE

Sycamore Networks last week announced upgrades to its optical core transport system that boosts the maximum distance between nodes and automates network setup, two features designed to reduce costs.

Sycamore is adding hardware and software to its SN 10000 long-haul dense wave division multiplexing gear that can boost the distance an optical signal travels by up to 50%. This means the equipment can support optical fiber spans of up to 1,550 miles with 160 wavelengths per fiber, depending on the type of fiber and the number of wavelengths multiplexed on the fiber.

Currently, the maximum span is 744 miles. The upgrade will also double to 80 the number of wavelengths that can be carried over a 2,480-mile span.

Because the spans can be longer or carry more traffic, providers don't have to buy as much equipment, Sycamore says.

A feature Sycamore calls super forward error correction (FEC) facilitates the distance enhancement. Super FEC corrects errors more effectively, Sycamore says, which translates into longer spans between nodes.

Alternatively, the technology can be used to boost the number of wavelengths supported over a given span on a single fiber, Sycamore says.

"This allows carriers to set up spans of [620 miles] or [62 miles]. They may need to redeploy a box somewhere else in their network, and this gives them flexibility," says Nancee Ruzicka, an analyst with The Yankee Group.

The company is also rolling out software that cuts the time it takes to turn up 160 wavelengths on an optical fiber across 25 spans from 30 days to 15 minutes. This automated process eliminates the need for two-person crews that travel from node to node, manually tuning each node, at a cost of $100 per hour each, Sycamore says.

The software adjusts the power of lasers and amplifiers used in the network using spectrum analyzers, required hardware for this automation.

Sycamore is also announcing it can drop or add any number of wavelengths at any given network node up to 160 wavelengths. Previously, the SN 10000 could only drop up to half the wavelengths on a fiber at any given node.

Dropping and adding wavelengths affects the power of the separate light channels in the fiber. This power must be equalized or the signal will have to undergo regeneration more often, a costly process involving converting the light signal to electrical, then back to light.

Sycamore accomplishes this equalization with amplets, which amplify wavelengths individually rather than all at once. Amplifying them all at once with a single amplifier increases the disparity between the power of individual signals.

The company is also announcing a new OC-192 card for the SN 10000 chassis that costs less and takes up less space (see graphic).

The add-drop capabilities are available now. The other features will be available in September.

Sycamore: www.sycamorenet.com

Smaller and speedier

The new Sycamore card boosts the capacity of a single bay of Sycamore Networks SN 10000s from 320G bit/sec to 640G bit/sec.

- Supports OC-192 optical channels.
- Costs a third less than current card.
- Occupies one slot rather than two.
- Employs newer, smaller components.

Issanni preps bigger subscriber management box

BY TIM GREENE

EATONTOWN, N.J. — Issanni Communications is rolling out a service management system that doubles the capacity of its previous high-end SMS.

The new system, the Issanni 2000, lets service providers manage broadband packet services such as voice and VPNs. It is one of three SMSes the company makes to set up simple DSL, cable modem and wireless Internet access, as well as more complex services.

Based on an eight-slot chassis, the device can support 62,000 individual sessions, more than twice that of Issanni's previous top-end SMS, the Issanni 1000.

The Issanni 2000 takes in traffic via frame relay, ATM or Ethernet links from customers and converts it to IP packets. It can perform network address translation, if necessary, to accommodate private IP addressing and apply policies.

For example, the device might tap a separate Remote Authentication Dial-In User Service database or Lightweight Directory Access Protocol server to authenticate users or grant authorization to a type of service. This is done via Issaniware, the software that runs on all Issanni SMSes.

The device can be fitted with an IP Security encryption card that can encrypt VPN traffic without sapping the CPU. The 2000 can also support delay sensitive voice and video traffic using proprietary methods that include fragmenting longer data packets to reduce the amount of time voice and video must wait before being processed.

Issanni 2000 competes with Redback's SMS products and Nortel's Shasta 5000 BSN, says Pat Hurley, an analyst with Telechoice.

Available now, the average price for the Issanni 2000 is $35,000.

Issanni: www.issanni.net

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Briefs

Ponte Communications last week introduced a package aimed at centralizing control of networkwide policy and security updates. Called **nsControl**, the system is designed to address the difficulties of managing security for the many types and brands of network devices that companies have installed. The system works like this: A company using nsControl must install a Control Server and as many Network Controls as are needed in the network, depending on the network's size. The Control Server is a Sun Solaris system running the nsControl software. NsControl software lets customers distribute security updates, system patches and new policies to every affected device on the network with one command, rather than dealing with each group of devices by type or vendor, according to Ponte. When a patch needs to be applied or new security policies are added, the administrator sends them from the Control Server to the Network Control points, which, in turn, distribute them automatically to the necessary devices. Pricing for the system depends on the number of servers and control points.

Ponte: www.ponte.com

Symantec last week announced **Web Security**, a server gateway available for NT, Windows 2000 or Solaris that can scan for incoming computer viruses and perform content-filtering by URL to prevent inappropriate Web use. The server software, starting at $2,500 for 100 users, includes a management console for controlling multiple gateways. Symantec will still sell separate antivirus and content-filtering products.

Symantec: www.symantec.com

Adobe helps tackle transactions

XML lets trading partners extract data from Adobe Acrobat files and import it to back-end databases.

BY ANN SULLIVAN

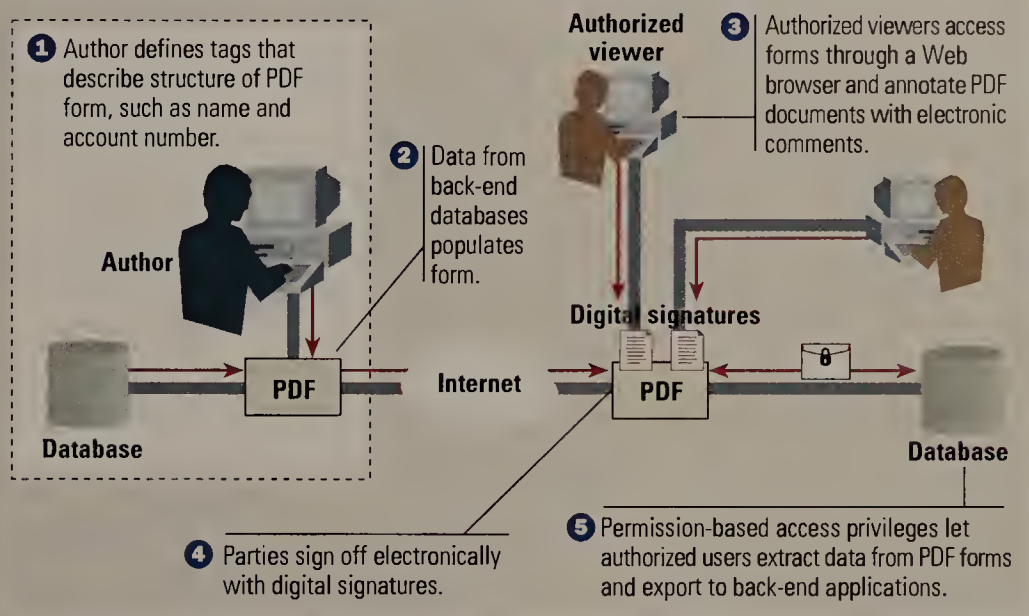
Service provider CCEWeb moves millions of dollars between financial institutions and their importer/exporter customers, and an unlikely software program plays a key role in the process:Adobe Systems'Acrobat.

Toronto's CCEWeb handles Internet-based transactions for parties involved in international trade, including banks, shipping companies, customs brokers and insurance providers. The company's @GlobalTrade service combines credit card and bank payment functions with a document management system that tracks the progress of complex trade transactions. Along the way, Acrobat-formatted documents, such as commercial invoices, letters of credit and insurance certificates, change hands.

Adobe has made a name for itself in cross-platform document sharing with its PDF, which preserves graphics features so a document looks the same when it's received as it did when it was sent — layouts, fonts and images intact.

A smarter Acrobat

Adobe Acrobat 5.0 preserves more than graphics; in this example, data stays intact and can be shared between parties' financial applications or customer databases.



But Acrobat traditionally has not been thought of as a corporate software application.

These days, PDF is about much more than making forms look pretty. In Acrobat Version 5.0, released this spring, Adobe added a number of new features aimed at enterprise customers.

One of those features is XML support for Adobe's electronic forms, called eForms, says product manager David Baskerville. With eForms, authors can specify fields such as account or invoice number, and data sources such as Open Database Connectivity (ODBC)-compliant databases, so that content can be pulled from back-end data sources and used to populate electronic forms. Information contained in fields can be saved in XML format and also exported to ODBC databases at the other end of a transaction. Previous versions of Acrobat supported data export only in a proprietary Adobe format.

Adobe also enhanced Acrobat's collaborative features to enable parties to review and comment on PDF documents through Web browsers. Authorized viewers can add comments to a data repository such as a WebDAV server or an ODBC database. Previous versions allowed Web-browser access to PDF files, but annotation tools were not accessible in the browser window.

These are two of the features CCEWeb depends on for its transactions, which are traditionally "extremely paper intensive,"

See **Adobe**, page 32

Kenamea boasts of secure, real-time delivery of Web applications

BY JENNIFER MEARS

SAN FRANCISCO — What if corporate applications could function with the same reliability and security on the Internet as they do on internal business systems? What if you could forever banish the hourglass icon or Web page error messages so common in Web-based applications? And what if you could do this without the costly investment of writing complex code? Figure it's all pie-in-the-sky? Start-up software maker Kenamea says not so.

Kenamea last week announced its Kenamea Application Network, the culmination of two years of software development the company claims will change the way applications are delivered over the Internet. While companies such as Bang Networks and Akamai are focusing on improving the delivery of content across the Web, Kenamea is focused squarely on applications.

And while vendors such as IBM, Tibco and Microsoft have improved application communication within back-

See **Kenamea**, page 32

'Net Insider . Scott Bradner

FORGETTING DCE

Some of you might remember Distributed Computing Environment, but it's not clear that some industry pundits or venture capitalists do. Or at least they haven't internalized a principal reason that DCE is, to put it politely, not prevalent today.

DCE is a set of technologies developed by the Open Software Foundation (now called The Open Group — www.opengroup.org) that lets a computer user employ network-based resources to augment his or her local computer. DCE, quoting from an IBM Web page, "is a comprehensive suite of integrated, yet modular, products which support transparent file access and secure resource sharing in heterogeneous, networked computing environments." (For more information on DCE, see www.faqs.org/faqs/dce/faq/.)

I'm sure the Open Group will call this simplistic, but in my mind a major reason that DCE was developed was to share resources, such as disk and processor cycles, over a network because having enough dedicated resources for individuals was too expensive. With DCE, the user can access databases without needing to have a local copy and can get heavy-duty processing done without as powerful a computer on his or her desk.

But the DCE proponents did not take into account the continued development of technology. Before the DCE specifications could be fully developed, disk and computer technology developed enough to negate much of the assumed advantages of using DCE. DCE was based on the assumption that the cost of managing the use of distributed resources would remain less than the cost of replicating them. This assumption did not prove to be long-lived.

There just may be a lesson in the history of DCE for those who are considering investing in peer-to-peer networking, storage as a service offering or maybe even VPNs.

I am leaving out a number of other arguments that were made in the case of DCE — single sign-on, centralized backup, centralized authorization management and more. Some of these arguments are now made for the newer technologies — they may prove to be as nondecisive as they were for DCE. I am also leaving out the ego factor that leads network managers to think that they should control everything that connects to their networks. That factor is harder to analyze — some of the egos are rather strong.

An undercurrent of Clayton Christensen's book, *The Innovator's Dilemma*, is that it is quite hard for people to take into account the fact that technology does not stand still when evaluating their options. It is much too easy to see what you can buy today and assume that it represents what will be available in the future. An example of this may be the pundits that dismiss using the best-effort Internet for telephony — all they can see is that it would not work well enough for them today. They forget that using today as a guide led to DCE's development.

Disclaimer: Harvard knows yesterday and today rather well, but has trouble with tomorrow, as do I. But I provide the above caution anyway.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Kenamea,
continued from page 31

end systems, Kenamea is taking things a step further.

The Kenamea Application Network is a messaging-based communications layer that uses Java and HTML and sits on top of any network that permits HTTP or Secure Sockets Layer (SSL) traffic. Instead of communicating by sending Web pages and dealing with hit-or-miss connections, Kenamea uses messaging technology to create a secure, persistent connection all the way from the back end to the end user and back again.

"What we're doing is providing fully bidirectional, event-driven, reliable and secure communications between nodes on the network," says John Blair, Kenamea president and CEO.

So for example, in an online trading application, when you input a purchase order and hit submit, instead of posting a request for a Web page, the Kenamea network packages a message and sends it to the back-end system. If there is a network outage or your wireless device loses service as you click on submit, a Kenamea switch, housed in an Internap collocation facility, stores that message until it can be delivered. The retry function works the same way going from the back end to the front end. And the messages are all encrypted.

What's best, says one executive with a large wireless network, is that it's all available out of the box from Kenamea — there's no heavy code that needs to be written.

An executive with a global provider of wireless and wireline communication services, who requested anonymity, says his firm began writing code to create the interactivity they wanted from their online applications, but found installing client software on user desktops became unmanageable. "Then came this product from Kenamea that does this for us," he says.

With Kenamea, end users can get real-time information without having to refresh entire pages, cutting the network load considerably, he says. "We expect big savings," he says, noting that his firm is in the process of rolling out the service to a pilot group of users.

Still, Kenamea may face some hurdles to acceptance in the business-to-consumer market because end users must download code to their operating systems. Blair compares the download to what users must do to run Flash on their systems, "but [the Kenamea code] is much smaller."

"Kenamea comes in for conservative organizations that want to do business over the Web but also demand the kind of control and the kind of quality guarantees they're used to having within their enterprise," says Mark Driver, research director at Gartner. "But they don't want to invest in all the proprietary or closed network infrastructure. They want to be able to leverage the public network infrastructure of the Internet."

The Kenamea Application Network service, available now, is priced based on simultaneous connections and bandwidth and starts at $5,000. It will be available as packaged software this fall.

Kenamea: www.kenamea.com

PROFILE: KENAMEA

Location:	San Francisco
Founded:	August 1999, by Bob Pasker (CTO), chief architect of the WebLogic application server, and John Blair (president and CEO), former partner with management and marketing consulting firm Regis McKenna.
Product:	Kenamea Application Network software, a messaging-based communications package that promises real-time response and secure delivery of Internet applications.
Financing:	Crosspoint Venture Partners, Azure Capital Partners, Lightspeed Venture Partners, Palm Ventures and other investors, totaling $41 million.
Employees:	90
Fun fact:	Kenamea means "send object" in Hawaiian.

Adobe,
continued from page 31

says Nick Pachnev, president and CFO at CCEWeb.

The United Nations estimates $640 billion in paperwork is spent annually to process international trade deals, according to CCEWeb. Bringing the transactions online and enabling Web-based collaboration between parties cuts down on the amount of paperwork that needs to change hands every time a document is revised.

The data tied up in the trade documentation — such as invoices, transport documents and payments — is critical to CCEWeb users; adding the ability to extract and reuse the data cuts down on the administrative chore of rekeying transactional data in financial applications, for example.

Currently, users can export Acrobat 5.0 data in Rich Text Format. A plug-in to export to XML is in beta release and is available on Adobe's Web site. The company has not determined when a final version of the XML plug-in will be available.

Enhanced security features in Acrobat 5.0 include support for 128-bit encryption and digital signatures. Better integration with software deployment systems from Tivoli and Microsoft makes it easier to deploy Acrobat to desktops in the 10,000 to 50,000 range, Baskerville says. With previous versions, individual installations from a CD were common, he says.

A single Acrobat 5.0 license costs $249.

Adobe Systems: www.adobe.com; CCEWeb: www.cceweb.com

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Reusable code quickens application development

BY ANN SULLIVAN

RECYCLING SOFTWARE

Corporations looking to save money and time are turning to reusable software.

Larry Singer has seen the ups and downs of software reuse. The CIO for the state of Georgia remembers when the federal government in the 1990s said it would pay for only five states to develop a particular software application needed for child welfare systems; the other 45 states would have to borrow the code. The intent was to save money by reducing software development efforts — but the states were ill-prepared to swap code, Singer says, and spent more money to integrate the code into their platforms than they would have to write it from scratch.

But times have changed. Singer is now on the managing side of an enormous software reuse initiative for the 50 states. As chairman of the component reuse subcommittee at National Association of State Chief Information Officers (NASCIO), Singer is working with a group of states and vendors to iron out the details of a national repository of software components. Component marketplace and infrastructure provider ComponentSource will host the repository, which Singer says will be up and running in October with a minimum of 13 and as many as 24 states participating from the start.

Already the project is saving money. During a trial run of the system, Georgia borrowed three software components from Arkansas for a vehicle registration application it was building. Integrating the components saved 424 hours of software development and $42,000 in development costs, Singer says.

Software reuse has drifted in and out of vogue for more than 30 years. Historically it has consisted of ad hoc efforts to save code in a repository that other developers could access. But this approach doesn't scale well beyond a handful of developers, experts say.

Lately there has been interest among corporations to adopt formal software reuse strategies in order to streamline development efforts — and save money in the process. Adding credit card authorization to an e-commerce application might take a developer six to eight months, including the time to set up contracts with vendors such as Visa and American Express. Alternatively, a marketplace could sell that component for a few hundred dollars and have it in place in days, says Sam Patterson, CEO of reusable software vendor ComponentSource.

Demand for reusable code is increasing. Gartner says that by 2003, 70% of new applications will be deployed as a combination of preassembled and newly created components to form complex business systems. Market research firm IDC predicts worldwide revenue in the software component market will increase from $516 million in 1999 to $2.7 billion in 2004.

The concept of component-based development (CBD) is the cornerstone of enterprise-level software reuse. The idea behind CBD is that developers work with preassembled building blocks of code developed for previous internal projects or purchased from third-party business application vendors. These blocks of code are stored in a central repository and tagged to identify their architectures and features.

In the case of NASCIO, the 50 states have software needs that are unique to state government but common to each other — making the states' components prime candidates for reuse. For example, rather than have all 50 states attempt to retool their Medicaid systems to comply with the Health Insurance Portability and Accountability Act's privacy regulations, states can share the development burden by swapping platform-independent components.

Charles Stack, CEO of component marketplace Flashline.com, says the time is ripe for CBD. Every other engineering discipline has moved to components, he says, citing automobile makers that buy preassembled car parts, architects who specify prefabricated building components and computer hardware makers that plug ready-made circuit boards into their shells. Now it's time for the software industry to follow suit.

Among the corporations embracing software reuse is CitiMortgage, which is employing Flashline's Component Manager2, Enterprise Edition as a repository for Java components to be reused across business units. Another early adopter is Electronic Data Systems' Europe, Middle East and Africa division; it is rolling out a Web services-based reuse platform from ComponentSource so its 10,000 developers in 12 countries can collaborate and share software component assets.

The current interest in enterprise software reuse can be attributed to a number of factors. One is a receptive market. Companies are trimming IT budgets and operating expenses, and software reuse fits nicely with these efforts.

Also speeding things along is that today's technology encourages CBD. Sun's Java 2 Platform Enterprise Edition (J2EE) environment is designed to support reusable components, as is Microsoft's forthcoming .Net architecture. The two differ in their approaches, but the results are comparable. With J2EE, a developer is tied to Java but can write components for multiple platforms. With .Net, a developer is bound to one platform but can use several programming languages to create components.

The buzz around Web services, too, is contributing to renewed interest in software reuse. Web services essentially are software components delivered over the Internet. Standards that will enable deployment of Web services are beginning to mature, including Simple Object Access Protocol for transporting XML-formatted messages between applications; Universal Description, Discovery and Integration for locating Web services; and Web Services Description Language for standardizing Web service descriptions.

Yet even as momentum picks up, corporations have a long way to go before they achieve large-scale reuse of 20% to 40% in their software development efforts, experts say.

Gary Barnett, principal analyst at Ovum, says reuse is one of the most elusive goals of software engineering. "It's nothing like the way we were promised when we were sold component-based development and object-oriented programming," he says.

One reason for the low reuse rate to date is that people haven't been trained to think in terms of reusable code, says Howard Modell, a systems administrator and reuse advocate. Making components that are reusable requires extra work on the part of the developer. Naming conventions and documentation need to comply with predefined standards so developers can search for code they need in a repository.

Cultural and political issues, too, are often cited as barriers to enterprise-scale software reuse. Getting developers to share their work and use the work of others requires a systematic reuse initiative on a corporate level, experts say. Modell compares software reuse to plastic or aluminum recycling efforts. While there are pockets of developers reusing software, it's still not automatic. For software reuse to reach its potential, Modell says "the rewards need to be so obvious that doing anything else would be unthinkable." ◪

Component brokers

A basic component marketplace brings together software buyers and sellers of software parts. Some vendors have added features such as enterprise management tools, outsourcing, software testing and user training to their component offerings.

ComponentSource

Includes public marketplace, component management system, outsourcing and testing tools.

www.componentsource.com

Flashline.com

Includes public marketplace, component management system, outsourcing and testing tools.

www.flashline.com

IntellectMarket

Includes public marketplace (ComponentPlanet.com) and component management system.

www.intellectmarket.com

Technology Update

An Inside Look at the Technologies and Standards Shaping Your Network

Ask Dr. Internet

By Steve Blass

In a previous column you mentioned Lucent's QIP software, and we were hoping for some more real-world information about using the tool set.

A reader who uses QIP provides the following information:

"QIP is a database providing a central location for all IP and subnet information. From QIP one can manage Windows 2000 DNS, NT 4.0 DNS, BIND 4.X, 8.X and Lucent DNS servers, and Microsoft, Nortel and Lucent Dynamic Host Configuration Protocol [DHCP] servers. We also run Active Directory as well as BIND-based DNS to support Microsoft Integrated Zones worldwide. Do I recommend QIP? It depends. There are many benefits that come with centralized IP management. IP address management tools are not simply DHCP services. For a firm with a few thousand IP addresses to manage, I would not recommend it. For a company with a few hundred thousand or more IP addresses, when even the 1918 space is at a premium, I would. And for tens of thousands of IP addresses, a centralized IP address management system is essential."

QIP support information is also available from Lucent at qip.lucent.com under "Technical Community" and under "Customer Service" on the individual product pages. The dhcp-v4@bucknell.edu mailing list available via listproc.bucknell.edu may be useful, and keep an eye on the BIND users list at www.isc.org for QIP and IP management-related discussions.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

XML gives voice to new speech apps

BY STEVE CHAMBERS

Speech technology is evolving to the point where an exchange of information between a person and a computer is becoming more like a real conversation. Many factors are responsible for this, ranging from an exponential increase in computing power to a general advancement of basic speech technology and user interface design.

Speech-based applications deployed to date have been based on code created by a few speech software vendors. VoiceXML will likely change this landscape by virtue of its promised vendor independence in creating speech applications.

VoiceXML is the emerging standard for speech-enabled applications. It defines how a dialog is constructed and executed between a caller and a computer running speech recognition and/or text-to-speech software.

VoiceXML incorporates the flexibility to create speech-enabled Web-based content or to build telephony-based speech recognition call center applications.

Specifically, VoiceXML outlines a common language to follow when programming a speech application. In VoiceXML, many of these rules are referred to as tags, as used in HTML. Tags denote actions for creating dialog between a human voice and speech recognition system.

An example of a VoiceXML tag would be <prompt> to queue an audio output. Main components of a VoiceXML-based service include tags, forms and rules that define the content, and a speech browser for interpreting and presenting audio content.

Vocabularies and grammars are the key components that define the input to a speech-enabled page. The vocabulary consists of the words to be recognized by the speech recognition engine. For example, a vocabulary for a flight information system might consist of city names and travel-related words such as "leaving" and "fly." Grammars provide the structure to identify meaningful phrases. A vocabulary and grammar are combined within a speech-enabled application to define speech recognition within a reasonable range of efficiency for both the caller and the speech recognition processor.

Designing a speech application includes presenting data for delivery over the phone, constructing a call flow and enabling prompts and grammars. VoiceXML provides a common set of rules as a flexible foundation, but it's up to the designer to create the appropriate flow and personality for a speech system.

Just as HTML content is interpreted by a browser and presented visually over the Web, so must VoiceXML be understood or interpreted for presentation over the telephone by a speech, or voice, browser. The speech browser serves as a gateway between a call and an Internet connection. It interprets VoiceXML code and manages dialog between callers and VoiceXML content located at a Web site.

Speech browser software also maintains the calls, presents voice prompts that equate to URLs and downloads pages for audio interaction.

A VoiceXML-based application using a speech browser provides flexibility, benefiting callers and content providers alike. A caller could use a rotary telephone or the newest wireless model and receive the same service. Content providers have a choice of locating a speech browser at their facilities or outsourcing to an application service provider, carrier or service bureau. As with current visual Web models, trade-offs have to be weighed between ease of implementation, flexibility, cost and other factors.

Today, companies are building businesses on speech-based Web content by providing telephony access and presentation of data in interactive audio formats. These businesses host speech applications to provide greater scalability, maintenance and support, while letting content providers focus on their core business.

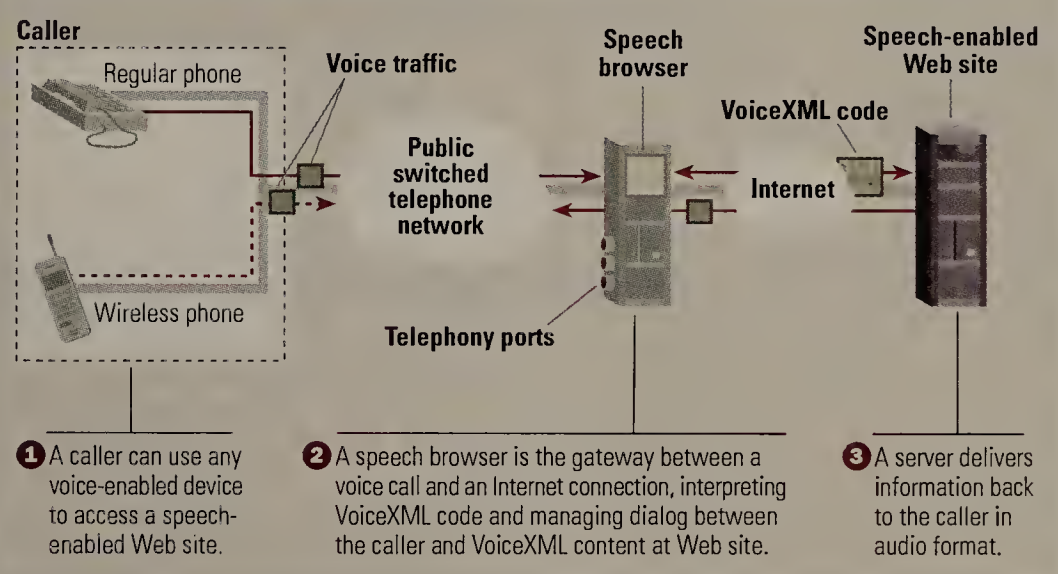
A number of obvious and subtle factors are converging to bring the Web model of VoiceXML to prominence. Many consider the broad industry support of VoiceXML its most apparent strength. Other factors such as recent improvements in text-to-speech quality mean information can be immediately presented in audio format without the time and expense of recording a voice. Looking at the evolution of the Web, it's clear the adoption of a common format for content presentation — HTML — fueled the growth of the Web as we know it today. The VoiceXML standard holds similar promise for speech.

Chambers is vice president of marketing at SpeechWorks. He can be reached at steve.chambers@speechworks.com.

HOW IT WORKS

VoiceXML

VoiceXML allows application developers to create new speech-based Web content.



Got great ideas?

Network World **is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).**

Gearhead . inside the network machine . Mark Gibbs

More FTPing

In our exploration of how FTP works that we began last week, we got a connection to an FTP server, authenticated ourselves, selected the data transfer type and found out what the default directory was. Now we need to find out what is in the directory, and here's where things get interesting. The server doesn't send data on the same connection that the client uses for commands — a separate port is used, and the client has two ways to handle the connection.

The passive mode (the command is "pasv") tells the server that the client will initiate the data transfer. In response, the server tells the client which port will be used (the first line is the client command and the next is the server's response prefaced with the operation's status code).

PASV
227 Entering Passive Mode (199,201,128,19,42,204)

The client then creates a TCP connection to the given port and reads the data.

Note that the reply codes that start each response line are grouped thusly: 1yz for Positive Preliminary replies, 2yz for Positive Completion replies, 3yz for Positive Intermediate replies, 4yz for Transient Negative Completion replies, and 5yz for Permanent Negative Completion replies. The "y" part gives a finer resolution of the status: 0 refers to syntax errors, 1 is for information, 2 for connections, 3 for authentication and accounting, 4 is unspecified, and 5 concerns file system status.

In the example above, the first 2 means we have completed the command and the second 2 means it involved a connection. The final digit (z) is very specific, and you should refer to RFC 959 for the details (see ftp://ftp.isi.edu/in-notes/rfc959.txt).

The alternative to passive mode is that the server is told, using the "port" command, to connect to a specific port on a specific IP address and then start to transfer the data. So:

PORT 10,0,0,102,14,159
200 PORT command successful.

Now we need to get the directory listing. The command "list" will return the contents of the current working directory or, if a path is given, a specified directory. The tricky part here is for the client to determine what the listing means because the server's reply will depend on whatever listing format the server's operating system supplies.

Many FTP clients understand the format returned by specific vendors and versions of an FTP server. The server type can be determined by the system command ("syst"), and the result will be a string as specified in RFC 1700 (see ftp://ftp.isi.edu/in-notes/rfc1700.txt — it's a huge RFC and you'll need to search for "OPERATING SYSTEM NAMES"). To really get it right, FTP client developers have to look for more clues to determine not only the operating system but also the FTP server implementation to which they are talking.

The command "nlst" will return just the file names (that is, without other directory data), and the "cwd" command lets you change the default directory. You can also go back up the directory tree with the change directory up command ("cdup"). Other directory operations include remove directory ("RMD <path>") and make directory ("MKD <path>"), but note all directory and file operations are limited to privileges you have through your logon account.

Next week, we get and put files. Comments to gearhead@gibbs.com.

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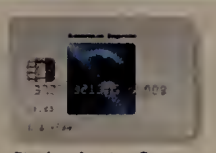

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Opinions

Editorial

Telecom storm reshaping the competitive landscape

When you add the loss reported by Lucent last week to the losses recently posted by Nortel and Cisco, you come up with a staggering combined quarterly loss of $25.4 billion. That's greater than the annual gross domestic product of Bolivia.

It gets even uglier when you look at year-to-date. For the first three quarters of its fiscal year Lucent reported a loss of $7.33 billion, Nortel reported a $22 billion loss for its first two quarters, and Cisco weighed in with a $1 billion loss for its first three quarters, ended April 28. That's a $30 billion sea of red ink.

The human toll is even more disturbing. Collectively, the companies are on their way to shedding some 78,500 jobs this year. That means these three companies alone are cutting roughly 10% of all the people employed by the Network World 200, the 200 largest companies in the network business (see www.nwfusion.com, DocFinder: 5333).

The gloomy news isn't surprising given the protracted telecom equipment slump, but it is interesting to examine how the maelstrom is changing the industry landscape. When the dust clears, things will be different, and Cisco won't look so puny next to the big guns that control the telecom market Cisco covets.

Consider that last year Lucent was a $34 billion behemoth, Nortel a $30 billion company and Cisco a $19 billion shop. Now put their most recent quarterly sales figures side by side: Lucent, $5.82 billion; Nortel, $4.16 billion; Cisco, $4.73 billion.

Because the companies' fiscal years are different, it is hard to get an apples-to-apples view of how they are faring this year. But if you scale them back to the first two quarters of their respective years, sales look like this: Lucent, $11.74 billion; Nortel, $10.36 billion; Cisco, $13.27 billion.

Cisco and Lucent's fiscal years are closest, with Cisco's year ending in July and Lucent's ending in September, so this comparison is perhaps most telling: Cisco posted sales of $17.99 billion for the first nine months of the year vs. Lucent's $16 billion.

Even though Lucent and Nortel have better relationships with telecom carriers, if the telecom slump is prolonged Cisco will be a much more formidable competitor when buying begins again.

— John Dix
Editor in Chief
jdix@nww.com

Message Queue

BACK TO BASICS

Reading Chuck Yoke's column "Network fundamentalism is not a bad thing"(www.nwfusion.com, DocFinder: 5323) sent me back to my days at Cisco, where I worked as a systems engineer for over seven years. During my last three years there, I interviewed two candidates per week on average. I developed a short interview that was technical in nature and covered just the basics of internetworking. In addition to the items Yoke listed, I led candidates through source route bridging and transparent bridging, as well as local and distributed load-balancing architectures and techniques. Nearly a dozen of the candidates that made the grade in my simple interview ended up coming to work for Cisco and did a great job.

Yoke's conclusions are spot-on. Too many folks have entered the networking ranks by spouting off a few acronyms without the fundamentals mastered. Most networks are complex entities. A firm grasp of the basics is required to function at a high level of competence.

Mark O'Saben
Senior systems engineer
Tiara Networks
Atlanta

MIXED BLESSING

Regarding "Managing the Windows mixed-mode monster" (www.nwfusion.com, DocFinder: 5325):

For ease of administration across this mixed environment, you could have used Novell's Account Management 2.1. This product gives you central administration, with detailed access rights, ease of moves and security for users, and positions companies for directory-enabled services on a global scale because of the eDirectory that comes as part of it. To assist eDirectory in desktop management you could add ZEN for Desktops 3.0, which provides application distribution based on identity, not group policies, and also has self-healing properties to reduce help desk issues. This move would also free companies from the de facto monopoly that Microsoft holds on businesses.

Alan Kerford
Managing director
IT Management Associates
Perth, Australia

ELECTRONIC BILL OF RIGHTS

I very much enjoyed reading Winn Schwartau's column "Needed: An Electronic Bill of Rights" (www.nwfusion.com, DocFinder: 5324). It was simple but not simplistic. As a vendor trying to deal with the Health Insurance Portability and Accountability Act and the former CEO of a provider that would have to comply with HIPAA, I applaud the feds for finally beginning to deal with privacy and security. However, I completely agree that a more comprehensive approach is needed.

The principles Schwartau outlines represent the scope of concept we should shoot for, and are articulated in a way that almost all consumers would immediately agree with. Nice job.

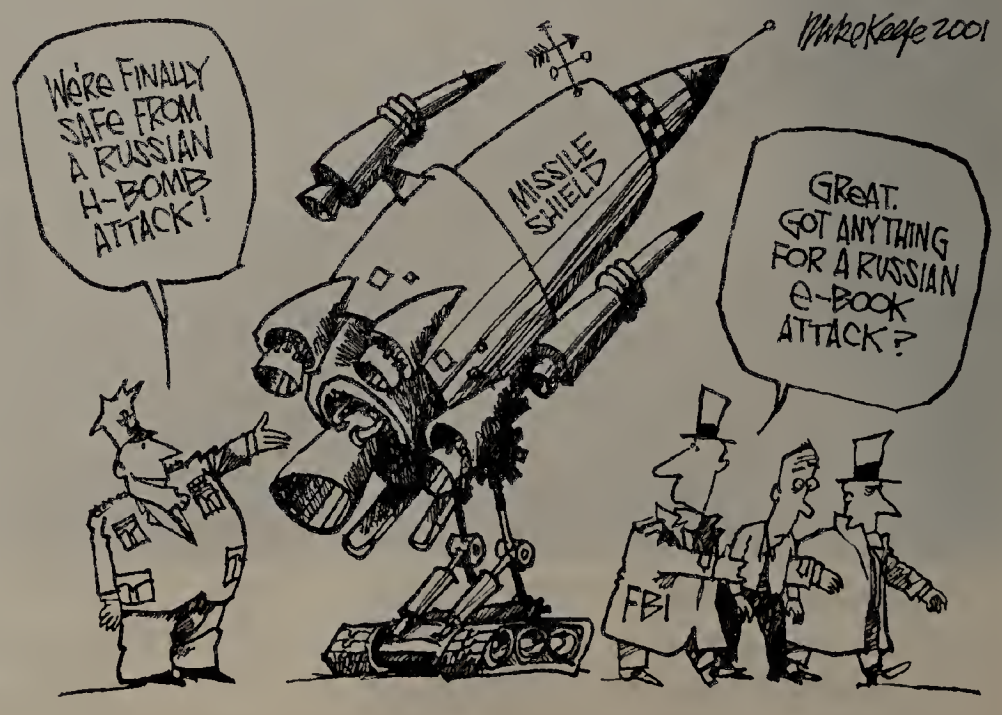
Les DelPizzo
Vice president, external relations
CMHC Systems
Dublin, Ohio

I would like to see Winn Schwartau's "Electronic Bill of Rights" hammered into Constitutional-amendment shape in a public process and presented to Congress by a broad-based, multifaceted body of voters and voting blocs that can't be shut up, shut out or shut off by the special-interest moneybags who are currently having cyberspace their own way. It's time we grew up and got in sync with the Europeans and took their steps further to privatize what is rightfully ours.

I would like to see some addition for tort liability for wrongdoing arising out of errors in, or misuse of, personal data, and I want governments and governmental entities, as well as nongovernment entities, to be subject to that kind of liability.

Dana Paxson
Technical specialist
Jaeckle Fleischmann & Mugel LLP
Rochester, N.Y.

Send letters to nwnews@nww.com or John Dix, editor in chief, Network World, *118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.*



Telecom Catalyst . Daniel Briere and Beth Gage

BUMPER CROP OF IT SLOGANS HITS THE HIGHWAY

Spending lots of time on the road driving to meetings with service providers and equipment vendors has made us aware of a new trend: the re-emergence of one of the oldest communications methods of the 20th century, the bumper sticker.

That's right, the faithful bumper sticker is enjoying a comeback, but with a new twist. These low-tech oldies are introducing the world to our industry's sense of humor. Next time you hit the highway, see if you spot any of these IT twists on classic slogans:

"Baby Bell On Board, Vehicle Makes Frequent Stops"

"How's My Provisioning? Call 1-800-FCC-FINES"

"Driver Carries No Cash: He's A CLEC"

"I Brake For Falling Valuations"

"Please Don't Bump This Car. It's All I Have Left Of My Stock Options"

"If You Don't Like The Way I Drive, Get Off The Supercomm Show Floor"

"Steer Clear: Former Lucent Employee Onboard"

Like most of America, the IT industry has its share of bragging parents. Take these recently spied bumper stickers:

"My Child Was ASP Of The Month At San Jose High School"

"My Honor Student Hacked Your Web Site"

"My Cable Modem Beat Up Your DSL Modem"

Of course some people can take anything too far, as is evident by these recent slogans seen on the back of some swerving vehicles back east:

"Download This!"

"My Lambda's Bigger Than Yours"

"Sure We Got 40G But Who Needs It?"

"Fiber Diggers Do It Deeper"

And after reading these bumper stickers, we figured it was time to get out of California:

"Honk If You Have Job Openings"

"If You Can Read This, I Guess You Just Got Laid Off Too"

"Help! My Valuation Has Fallen and Can't Get Up!"

But the mood is not totally depressing these days. We see a few signs that give us hope, despite the fact most of these cars were in the parking lot of the local unemployment office:

"Happiness Is Seeing The Nasdaq Recover"

"Save those Stock Options Boys, The Nasdaq's Gonna Rise Again!"

"Please Buy From Me, I Promise To Be Here Next Year"

What bumper stickers did we miss? Let us know what bumper stickers you would make up and what bumper stickers would best represent your company as we finish the second half of 2001.

Briere is CEO and Gage is vice president of TeleChoice, a market strategy consultancy for the telecommunications industry. They can be reached at telecomcatalyst@telechoice.com.

Industry Commentary . Frank Dzubeck

ROUTER EVOLUTION MIRRORS THAT OF THE COMPUTER

It has been more than a decade since the IP router arrived on the scene to solve the problems of IP network-to-network address resolution and internetwork communication. A lot has happened to the router since then. In the beginning, the router was a simple uniprocessor-based device that performed the software tasks of protocol conversion, packet analysis, table lookup and maintenance, network discovery, management and, last but not least, IP routing. It was the time of the "router wars," with the press full of "speeds and feeds" announcements. The battles were fought in test laboratories and in semipublic customer trials. Victory lasted only until an opponent's next software upgrade could be tested in a laboratory or the next marketing claim was made at an industry trade show.

The first major change in router architecture was subtle: It involved the use of hardware assists to speed up software table lookup and maintenance functions, and the creation of line cards to offload protocol conversion. This change facilitated true wireline routing and helped the router's architecture evolve into a rudimentary multiprocessor.

The second major architecture change was drastic and has shaped the industry since its introduction. That change was the physical separation of routing from the switching function. In reality, the Layer 3 function of routing need occur only on the header packet of the message flow; once the table lookup occurs and the route is established, all subsequent packets in the message flow can be switched to that route. With the advent of separate and distinct hardware routing engines and forwarding engines, true symmetrical multiprocessing had arrived within the router, and to this day is its dominant form of hardware architecture.

More importantly, routing was reduced to an application in a router. This meant routing could be embedded into other systems, such as Layer 2 switches in LAN environments. Multiple forms of routers, such as access routers, Layer 3 switches, and edge and core routers, began to evolve in parallel based upon port density, packet processing speed and the addition of IP-oriented value-added services.

On the low end of the spectrum is the smallest uniprocessor router — a network processor chip executing the routing application. Because Routing Information Protocol using static routes and broadband access speed using xDSL, ISDN, T-1 lines or cable modems is required for small and midsize businesses, the access router can be constructed with minimal components and purchased at a minimal cost. Today's access routers even contain an eight-port Ethernet LAN hub or switch, firewall and VPN security for less than $400.

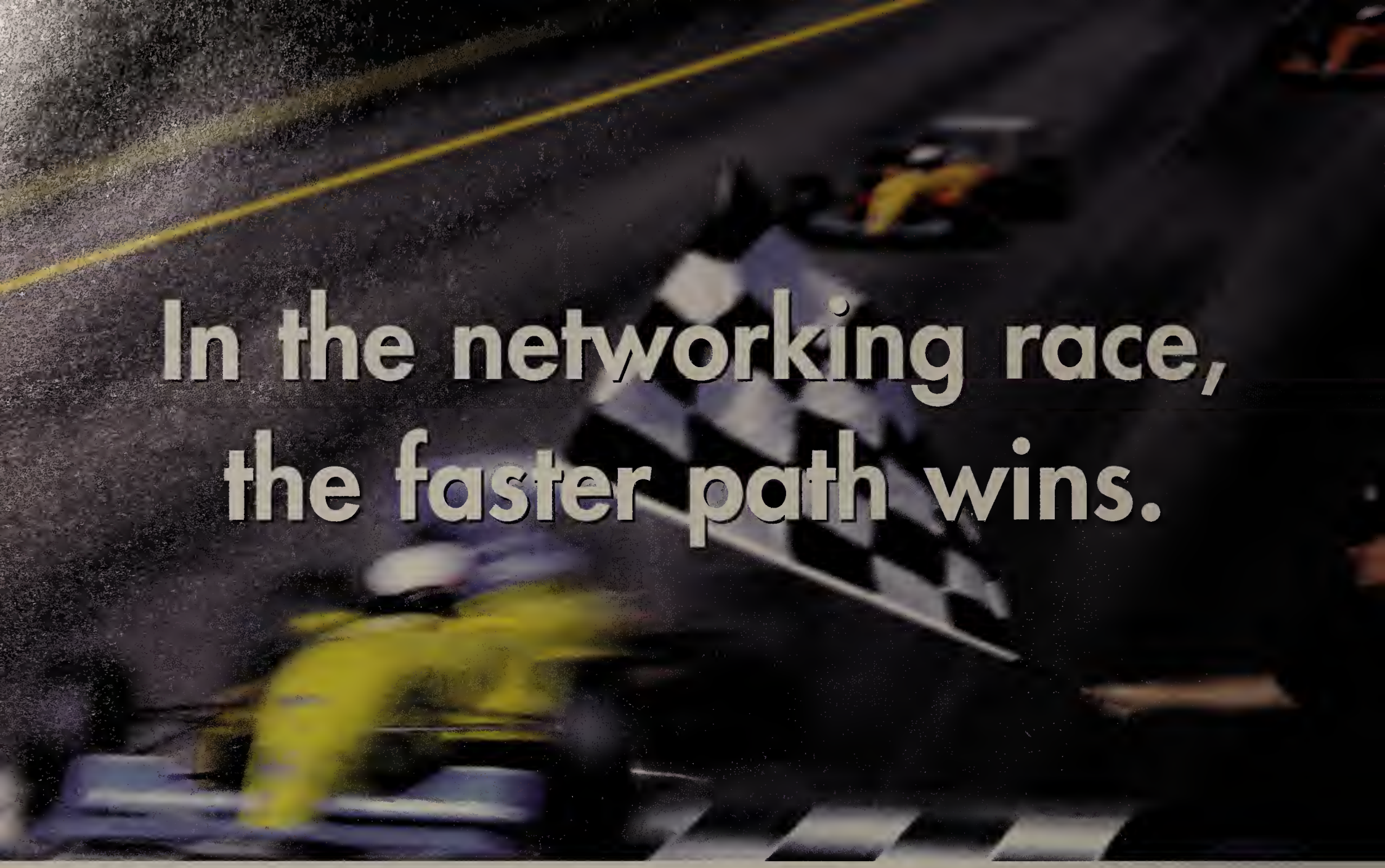
Higher processing speed and more sophisticated embedded multichip network processor-based routers are used in large enterprise WAN access gateways and as route processors in service provider network edge routers. In this type of device, symmetrical multiprocessing is used to achieve wireline (up to OC-48) packet processing speeds measured in megapackets per second. The addition of a services layer implemented using packet content classification, VPN control and management, and Multi-protocol Label Switching for quality-of-service software has made the edge router a powerful communications infrastructure tool.

Two forms of edge router exist: retail for unique customers and wholesale for connected networks. Initially, the architectures of these routers differed only in software, but wholesale router architecture recently split into two parallel development tracts, one using software to create virtual routers for each connected network and the other using a true parallel multiprocessing architecture to give each connected network a physical route processor. The latter approach is of particular interest to carriers whose customers demand the highest level of service — physically independent router table maintenance and management views for each customer, and the restart/reboot of a customer router independent from other customer routers.

The core router is another story. This has been the almost exclusive territory of the experienced ASIC designer with the most innovative approach to simultaneous parallel pipeline packet processing. In the service provider core, wireline processing speed (up to OC-192) and the simultaneous routing of gigapackets per second are the keys to success. Network designers use replication or single image clustering of shelves, chassis and racks to achieve scaling in the core and produce high-density, high-throughput configurations.

The router has evolved and will continue to evolve in a manner similar to the computer — from microprocessor to parallel multiprocessor and everything in between. Evolutionary parallels always exist in this industry, but you will find no closer parallel hardware evolutionary paths than those of the computer and the router.

Dzubeck is president of Communications Network Architects, an industry analysis firm in Washington, D.C.



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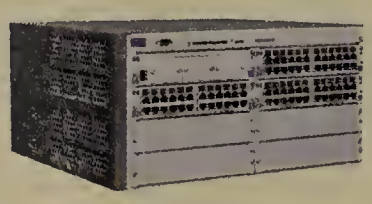

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Opinions

FACE-OFF

Is the enterprise ready for virtual routing?

Is virtual routing a viable option for today's corporate networks? Crescent and Allegro duke it out.

YES BY GERALD WESEL

After experimenting with several generations of IP service technologies, companies are still struggling to find a WAN technology that supports IP-based applications, such as managed intranets and extranets, and high-speed Internet access.

To relieve themselves of the need for scarce, costly engineering talent, many companies prefer outsourcing the installation, provisioning and management of their IP backbone networks to network service providers. First-generation IP VPN products and second-generation network-based VPN products have provided secure access for multiple customers over a shared IP backbone. However, the cost and complexity of deploying and managing these systems limits their application to small businesses and remote access applications. Because the number of tunnels required grows exponentially as the number of sites increases, the Layer 2-based tunnels of VPNs that use IP Security, Point-to-Point Tunneling Protocol and Layer 2 Tunneling Protocol cannot scale to support larger networks.

Now, with the development of new virtual routing platforms, these companies have a practical WAN technology for IP-based applications. Essentially, a virtual router is a logical subdivision of a physical router. By virtualizing the routing functionality, a virtual routing platform can support multiple "routers" in a single system to create economies of scale and reduce network complexity. The latest generation of virtual routing platforms are fully customizable to simultaneously support a broad range of routing protocols, can scale from a small private domain to the complete Internet route table, and can operate separate management software for each virtual router.

By providing separate routing protocols and tables for each corporate customer, virtual routers provide the security each company requires while avoiding the need to re-engineer any corporate network. In addition, today's virtual routing systems integrate quality-of-service technologies to ensure predictable performance, and recent advances in network processors have dramatically improved the reliability of virtual routers. As a result, a service based on virtual routing gives companies the media independence, resiliency and performance of a private network, without the incurred capital expense and operational complexity of building that network with separate physical routers.

Corporations have long awaited a service provider offering that meets their need for a low-cost, high-performance, highly customizable network for their IP-based applications. Today's virtual routing platforms enable network service providers to offer their corporate customers an attractive set of managed wide-area intranet, extranet and Internet access services at affordable prices.

Wesel is CEO of Crescent Networks, a Lowell, Mass., provider of carrier-class products for routed network services. He can be reached at gwesel@crescentnetworks.com.

NO BY TROY DIXLER

Virtual routing is nothing more than a catastrophe waiting to happen. Created as a way to scale VPNs by overcoming the single-domain system architectures of monolithic routers, virtual routing introduces scalability, security and management problems that prevent network managers from ever recognizing the benefits touted by proponents of the technology.

Think about running all of your company's mission-critical applications on a single server. If any type of anomaly were to affect the hardware or software on that system, it could crash every application at once. Virtual routing is no different.

Virtual routers are simply traditional monolithic routers based on today's architecture, harboring many single points of failure. They possess a single CPU, a single bank of memory, a single software image and a single management plane. These critical resources are "virtually" divided and shared among all virtual routers on the system. Isolation between routers is literally virtual, not physical. This raises scalability, reliability, security, true isolation and autonomy issues.

Collapsing multiple physical routers into a single system — the central theme behind virtual routing — requires scaling the intelligence of the routers by an order of magnitude. The requirements for CPU and memory power increase by the number of routers and the requirements of each protocol within each router. Having to recalculate routes on all virtual routers at once would exhaust the most powerful CPU.

Another major issue is security. The effect of a single distributed denial-of-service attack to a virtual router system would be a death knell to any carrier offering this service. Just one attack could rob enough resources to starve other routers from processing critical routing updates and therefore affect all other routers within the system. In addition, the carrier has full visibility into the routing and policy configurations of the virtual router customers. These customers no longer have the ability to manage and secure their own configurations.

Virtual routers are often touted as a panacea at the network's edge because of their perceived ability to support multiple autonomous systems within a single system. Yet virtual routers force all control traffic into a central processor, providing no better solution than their monolithic brethren.

Virtual routers are plagued with single points of failure everywhere, from one image of the operating system software shared by all routers, to one configuration file, to one bank of memory, to one route processor. What's really needed is a fundamental rethinking of traditional monolithic router architecture to one that provides physical isolation and partitioning of resources with dedicated CPUs, memory and software for each router within a multirouter system.

Dixler is co-founder of Allegro Networks, a broadband infrastructure company in San Jose. He can be reached at troy@allegronetworks.com.

PEER-TO-PEER POTENTIAL

Charlie Catlett, chairman of the Global Grid Forum, says businesses are getting turned on to grid computing.

ADAM B. AUEL

It's time to give an old technology a second look for the processing power, file sharing and collaboration capabilities it can provide.

BY SUSAN BREIDENBACH

Peer-to-peer has been generating lots of attention. Like PCs in the 1980s and the Web in the 1990s, industry watchers say it is one of those disruptive technologies that will turn much of computing upside-down.

This doesn't resonate well with IT professionals who have unpleasant memories of certain early LAN technologies. They call peer-to-peer unsecure, unscalable and unmanageable.

But peer-to-peer technologies are slipping in the back door, and they are a lot less visible than PCs were. Cost isn't as much of a barrier, either. With industry giants such as Intel and Sun backing major peer-to-peer initiatives, it's time to reevaluate peer-to-peer.

"If you are supporting a group of employees who are collaborating with partners on a project, and they go from four people talking once a week and sharing five files to 12 people talking three times a day and sharing 500 files scattered across four companies, [peer-to-peer] technologies can make your job — and theirs — a lot easier," advises Andy Oram, editor of the book *Peer-to-Peer.*

This isn't Windows for Workgroups

Of course, peer-to-peer isn't a new concept. IP routing is peer-to-peer, as is the rest of the Internet's original foundation. But the sudden commercialization of the Internet in the mid-1990s imposed a client/server superstructure.

If peer-to-peer wouldn't scale in its previous incarnations, why is it ready now? Directory technologies, such as Lightweight Directory Access Protocol (LDAP), weren't around in the 1980s, and computing power, network bandwidth and storage capacity are thousands of times what they were. It took too much effort to set up and manage peer-to-peer connections, and the resources just didn't exist.

Now Sun is pushing peer-to-peer with Project JXTA, an open source initiative to develop standards. The goal is to let existing and future computing platforms of all types and sizes interact as peers.

"JXTA is the turning point that will make enterprise [peer-to-peer] possible," says Leon Guzenda, CTO for Objectivity, a Mountain View, Calif., developer of distributed database technology that uses peer-to-peer. "Sun has brought together what you need to build a kernel for [peer-to-peer], and they have partners to build the layers above it. Right now it's quite primitive, like an early version of the Unix kernel, but it's very powerful."

Peer-to-peer is a set of concepts rather than a specific technology. Industry analyst Mike Neuenschwander of The Burton Group defines it this way: A movement to network distributed content and resources that are valuable in aggregate, but must remain in the custody of their various owners.

"Business-to-business interactions come to mind here, because one IT department doesn't own all the resources," Neuenschwander says. "But if you can bring content to a centralized place, it is better to do so."

Pure peer-to-peer applications are relatively rare, and their utility in a corporate environment is still suspect. Peer-to-peer products targeting the corporate market tend to use a hybrid approach with some sort of central authority.

Endeavors Technology in Irvine, Calif., uses "brokered peer-to-peer." A registration server functions as a gatekeeper for people entering and leaving a particular peer-to-peer community. But once individuals have joined that community, all communication takes place directly between peers.

Creating virtual supercomputers

The most dramatic peer-to-peer technology involves reclaiming unused computing cycles on desktop computers and harnessing them into a virtual supercomputer. This platform can run huge applications that are "pleasingly parallelizable" because they can be broken into small pieces and run on separate machines.

According to the Omni Consulting Group, the average number of unused computing cycles in a company is about 47%, which includes heavily used servers and hosts. When desktops alone are considered, the percentage is much higher.

Some early grid computing initiatives have been philanthropic, getting people to donate computing cycles for medical research and the SETI@Home project. The latter claims the title of world's largest distributed supercomputer, with more than 25 teraflops of processing power.

However, Charlie Catlett, a senior fellow at Argonne National Laboratories and chair of the Global Grid Forum (GGF), says businesses are taking notice. "Commercial enterprises now account for about 20% of the attendees at the GGF meetings," he says.

Commercial application of grid computing has been going on for quite some time. Manufacturers such as Pratt & Whitney and Boeing have used grids of computers instead of wind tunnels to simulate and analyze the flow of wind over a structure. Similarly, distributed workstations are being used to conduct seismic analysis, crash simulations and risk analysis.

"If a computational task can be done in a short time, [peer-to-peer] doesn't make sense," says Paul Kirschner, a senior project analyst with United Technologies Research Center in Hartford, Conn. "If it will take hours, [peer-to-peer] might be a fit."

Stephen Elbert, director of applications for Entropia, says the human genome project depends on grid computing. Genome sequencing that used to take years can now be completed in weeks or days.

The San Diego company's Entropia 3000 software takes a large application, splits it into small tasks and distributes them to participating PCs. The server monitors their progress and can reassign tasks. The task runs entirely in the background, and a sandboxing technology isolates this activity and prevents the server from seeing the PC user's files. "Bioinformatics is one industry that really needs grid computing," Elbert says. "They are crunching much larger data sets, and doing in-silico rather than in vitro or in vivo research."

Three years ago, J.P. Morgan started evaluating grid computing for compute-intense risk-management systems, but could not find a ready-made product that fit the bill. The investment bank — now J.P. Morgan Chase — built a homegrown technology instead.

"When you can add a second 1-GHz CPU to a desktop for $600 instead of getting an additional CPU on an enterprise server for 15,000, that looks pretty good," says Steven Neiman, who heads up high-performance computing for J.P. Morgan Chase.

The tradeoff is that peer-to-peer raises maintenance costs. To use peer-to-peer, the financial firm had to modify some of its desktop management policies and educate users. There was an up-front development cost of about $2,000 per desktop, along with an annual maintenance cost of about $600 per desktop.

However, with the recent emergence of products from such vendors as DataSynapse, Entropia and United Devices, J.P. Morgan Chase would like to migrate from its proprietary technology to a vendor-supported turnkey platform that could be used to expand peer-to-peer operations.

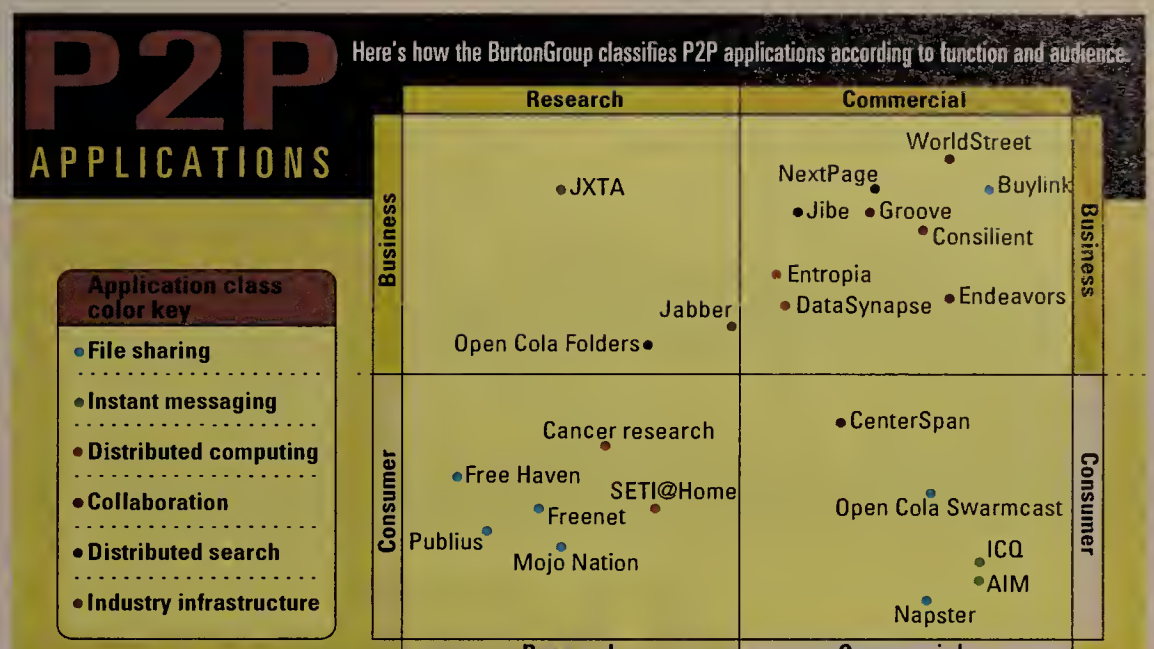
Neiman says cost alone isn't what makes peer-to-peer compelling. Longer term, he says he hopes Internet-based peer-to-peer will enable naturally distributed applications that can gather competitive market intelligence. Such programs would go out to the Web and mine hundreds of sites. The information could be crunched and distilled on distributed peer-to-peer nodes before it is brought back through the firewall, effectively creating an edge server network in reverse.

Content distribution and file sharing

Most of the files in today's companies are on PCs, not servers, and peer-to-peer can let you see all these storage assets as one big distributed file space. A workgroup member might even be able to find the sketch of an idea you've just begun on your PDA.

The FedStats Interagency Task Force uses NextPage's NXT3 to syndicate content across some 60 portals maintained individually by agencies of the federal government. NXT3 uses XML for messaging among the servers and doing search requests across them. The content continues to be distributed but users see it as a single source.

"XML tagging, combined with HTML and the [peer-to-peer] architecture of NXT3, enables you to pull frag-



ments of distributed content together on the fly and create new documents," says task force member Brand Niemann, a computer scientist with the Environmental Protection Agency.

The proof-of-concept pilot, which used only public information that resided outside agency firewalls, helped overcome initial resistance. "Once people saw what it could do, they couldn't get it fast enough," Niemann reports.

Intel uses peer-to-peer to streamline the distribution of computer-based training materials to employees. The IT department didn't want people to download huge multimedia files from a central server, so programmers built an application called Share and Learn and deployed it on every desktop. When a user clicks on one of the listed courses, the application searches for the courseware locally and then gradually widens the search. Once a user downloads the material, the application knows the closest place to find it.

"By effectively caching the files on the machines of the people who first download them, we have reduced the burden on our network substantially," says Bob Knighten, a peer-to-peer evangelist at Intel's Microprocessor Research Laboratory in Beaverton, Ore.

Collaboration

Collaboration is the peer-to-peer category that really brings power to the people. It is transforming the Web into a much more personalized environment, in which you can share information on your own terms.

"Two brains are better than one, and [peer-to-peer] enables real-time knowledge sharing," says Vijay Srinivasan, president of Global eTech, a San Jose system integrator building business applications with Endeavors' peer-to-peer technology. "[Peer-to-peer] applications will make it easier for people to do their work. In contrast, workflow can be more complicated to support with a server-based architecture, and consequently it gets restricted."

For the past four years, government contractor Syntek Technologies in Arlington, Va., has worked on a Defense Advanced Research Projects Agency program aimed at improving government decision-making.

"We found that decisions are better when people make them collectively in small groups," says Greg Mack, vice president of IT and internetworking at Syntek. "Also, it's important to get the right people involved, and all the right people aren't always present. So we needed a way to do collaboration among distributed people on distributed systems."

Last fall, Mack and his team discovered Groove, the brainchild of Lotus Notes inventor Ray Ozzie. They became beta version users of the software and have been pleased with it. The whole environment is on each local system, so people can work offline. Changes are automatically cached, and updates are made in both directions when an individual reconnects.

"With products like Groove, you can collaborate with people outside your company, and you don't have to figure out who is going to set up a resource group," The Burton Group's Neuenschwander says. "The IT people don't have to set up servers and punch holes in firewalls."

Peer-to-peer facilitates ad hoc collaboration around a context and can enable secondary e-commerce activities to develop around e-business communities. For example, an automobile manufacturer can reduce the inventory of parts at its distribution centers by encouraging parts arbitrage among dealers. This reduces inventory and shipping costs and alleviates distribution bottlenecks.

Security snags

Security has been a major barrier to peer-to-peer adoption. The different platforms being used within a company and across an extranet all have different security systems, and it is hard to get them to interoperate. People end up using the lowest-common-denominator features. The peer-to-peer community is trying to adapt existing security standards such as Kerberos and X.509 certificates.

"In grid computing, what you are really trying to do is take separate resources and build loose federations, often on the fly," says Marty Humphrey, co-chair of the GGF's Security Working Group. "Kerberos is more of a centralized technology, and doesn't scale well across a distributed environment."

Similarly, Secure Sockets Layer (SSL) and X.509 don't allow for single sign-on or delegation. The GGF's Security Working Group has proposed a standard for X.509 proxy credentials that would let one peer "impersonate" another by delegating identity remotely as part of the SSL protocol.

PEER-TO-PEER PREP WORK

- **Keep P2P** on your radar screen and assign someone to stay on top of it.
- **Initiate** some prototype P2P on any intranet, where you can minimize variables.
- **Involve** the friendliest groups first, and communicate constantly.
- **Make careful use** of sandboxing as you roll out grid computing.
- Develop a **standards list** for P2P technologies and applications.
- Start **assessing the impact** of P2P on your own particular network environment.

Collaborative peer-to-peer products, such as Groove and Endeavors' Magi 2.0, cater to corporate environments by incorporating strong encryption and authentication technologies. The products basically implement a public-key infrastructure that is used automatically in ordinary exchanges between peers.

"When we have conversations that are sensitive, we now use Groove instead of e-mail," Syntek's Mack says. "It is much more secure than instant messaging."

Ironically, peer-to-peer environments have some inherent resilience to attack that client/server architectures do not. When information is distributed, there is no convenient point of attack for intruders. Similarly, peer-to-peer platforms are inherently fault-tolerant because a single system going down has little or no impact.

Peer-to-peer technologies can also be used to improve security in e-business environments by providing fine-grained access controls. "We need a more lateral approach to security," says Andrew Grimshaw, founder and CTO of Avaki, a peer-to-peer developer in Cambridge, Mass. "It opens up the network, but in a very constrained way. You are controlling things at the software layer rather than at the network layer."

Nevertheless, the prospect of peer-to-peer connections across organizations tends to give network professionals nightmares about corporate espionage and new ways to spread viruses.

"When you go through a firewall to a public network or extended private network, management issues go up an order of magnitude and security and privacy issues go up several orders of magnitude," says Terry Retter, director of strategic technology services at the PricewaterhouseCoopers Global Technology Centre in Menlo Park, Calif.

"People need to stop thinking about protecting computers and start thinking about protecting information," Retter says. "That shift hasn't happened yet. But think ahead to when we have several billion handheld devices accessing all kinds of things. You have to firewall almost at the object level. We're not there yet, behaviorally or technically."

Managing the environment

Questions about peer-to-peer manageability have to be evaluated even though people, processes and computing power are moving to the edge and beyond the edge.

"IT professionals are in denial about what is going on among the desktops," Neuenschwander says. "They are not really in control of content and of what employees do with it. Peer-to-peer technology could give you better control or at least better knowledge of what is happening on the desktop."

JXTA includes peer-monitoring hooks that will enable the management of a peer node. People can build visualization tools that show how much traffic a particular node is getting. With such information, a network manager can decide to increase or throttle bandwidth on various nodes, or implement a different level of security.

Meanwhile, companies are already finding it costs less to administer laptops in the field on a peer-to-peer basis.

"Say there are mobile users in the field who need new virus signatures or other software updates," says Frank Bernhard, managing principal in charge of Omni Consulting Group's supply chain and telecommunications practice. "I need a way to go out and scan these computers and see what's on them. I can set up [peer-to-peer] relationships and distribute fixes and patches more efficiently than I could over the general network. It enables customization to each desktop rather than a general download to everyone."

Administrative overhead is one of the gating factors for peer-to-peer applications; they must be easy to deploy and use. If you opt for password-based security, make sure the product integrates directly with your company's LDAP implementation. Also look for tools that support legacy data with minimal fuss and monitoring capabilities that can collect statistics about usage.

Peer-to-peer pressure

When peer-to-peer happens, it will happen because of a killer application, and your users will figure out a way to implement it themselves. It's time to seize the initiative so you can stay on top of the situation.

Today's peer-to-peer efforts are being compared with the advent of Mosaic eight years ago. It is very early, and many things companies are developing will never fly. But some of them will, and they may be very disruptive.

According to Neuenschwander, technological objections to peer-to-peer are often just a smoke screen for philosophical differences. Peer-to-peer enables "me-centric" computing as the view is lateral or bottom-up instead of hierarchical and top-down. It is a cultural movement that attempts to align computing with the needs of the individual who is using the software, and it is meeting with a lot of resistance from the powers that be.

"Maybe [peer-to-peer] has to come in through the back door, like PCs did," concludes Garry Allen, a consultant in Kingston, Ontario, who has 20 years of experience with custom programming and system design. "Any IT professional that is not looking seriously at [peer-to-peer] is going to become a dinosaur."

Breidenbach is a freelance technology journalist and consultant. She can be reached at sbreidenbach@nsa.net.

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Feature

GOODBYE DES, HELLO AES

BY JIM REAVIS

New encryption standard is faster; mobile devices benefit from small footprint.

Security products should begin rolling out this year based on Advanced Encryption Standard, which the U.S. government has selected to replace the current Data Encryption Standard, AES' predecessor.

The National Institute of Standards and Technology (NIST) in October selected Rijndael (pronounced "rain doll"), the combined work of Belgian researchers Vincent Rijmen and Joan Daemen, as the basis for AES.

Rijndael was selected from among five finalists in a process that took more than three years.

Although a fundamentally sound algorithm, the older DES, which dates back to the 1970s, has been proven to be breakable through brute-force attacks because it uses a relatively small key size (56 bits).

As a practical matter, anyone today who wants high security uses a more powerful version of DES called Triple-DES.

To start encrypting with Triple-DES, two 56-bit keys are selected. Data is encrypted via DES three times, the first time by the first key, the second time by the second key and the third time by the first key once more. This process creates an encrypted datastream that is unbreakable with today's code-breaking techniques and available computing power, while being compatible with DES.

However, one does not need to be a cryptographer to see future problems with Triple-DES. Needing to encrypt a singular piece of data three times before transmitting it is CPU-intensive. While encrypting data today is the exception, not the rule, it's likely that encryption will become more prevalent in the future.

With the rise in the use of the Internet and devices such as smart cards, cell phones and PDAs, the need to communicate securely will increase. But these smaller devices require an encryption standard with a smaller footprint that uses less resources. Triple-DES is not a workable solution for the future.

While security and network administrators are loath to upgrade their systems to add another encryption algorithm, they will eventually need to support AES.

Unbreakable security

AES has more elegant mathematical formulas behind it, and only requires one pass to encrypt data. AES was designed from the ground up to be fast, unbreakable and able to support the tiniest computing devices imaginable. The big differentiators between AES and Triple-DES are not strength of security, but superior performance and better use of resources.

The next step is getting AES out of the mathematicians' hands and into products. NIST is writing the formal standard for AES, with a targeted completion of later this summer. The formal standard will then have a permanent Federal Information Processing Standard (FIPS) number associated with it (DES and Triple-DES are FIPS 46-3). The algorithm itself is widely available and a limited number of products are already being released that support it.

Adoption will likely fall into two categories: upstart vendors seeking to gain market share and notoriety by being early adopters, and established market leaders that are in less of a rush.

RSA Security, developer of widely used encryption algorithms and developers' tool kits, has announced its intention to support AES, but will likely wait until the FIPS number is assigned this summer. RSA was one of the AES finalists whose algorithm did not get selected. CheckPoint Software is working on beta versions of AES for its products.

Cisco released a position paper in February stating an intention to support AES. Cisco also pointed out that as a practical matter AES won't be widely implemented until it moves through the Internet Engineering Task Force (IETF).

For VPNs, the IETF needs to specify how AES should be implemented within the IP Security standard to maintain compatibility in a multivendor network. The same type of definitions must be developed for Secure Sockets Layer, the encryption process for Web browsers and Web servers.

Most vendors will probably begin shipping products with AES this fall because delaying any longer risks exclusion from federal contracts (Triple-DES will still be a government-approved method, but it is logical to expect that products compatible with both methods will be preferable). AES should be widely implemented by 2004.

The reasons IT executives will want AES in their networks are well-aligned with the reasons AES was developed in the first place: It provides faster encryption and compatibility with the widest range of devices. Without AES, it will be necessary to have different encryption technologies for application-specific purposes, such as wireless e-mail, financial transactions or quality-of-service-specific applications.

The biggest benefits that IT executives will see in adherence to the AES standard are those normally associated with standardization. Reduced prices, greater compatibility, more innovation and increased flexibility will all be outcomes of getting the industry to support AES.

An important step for IT departments to take is to specify AES compatibility on requests for proposal for data processing equipment that will be performing encryption. If it currently isn't supported, it is wise to push for a firm support date and a free upgrade at that time.

What about researchers Rijmen and Daemen. Will they become rich and famous over their contribution?

As part of the process for submitting algorithms for consideration, developers had to agree to put their creations into the public domain and receive no royalty payments whatsoever.

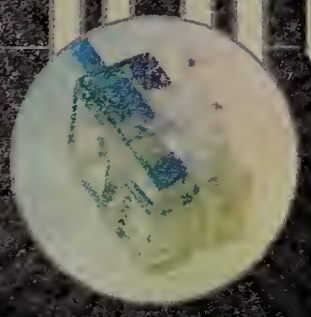
So other than receiving a lot of attention and being considered national heroes, the creators derive no other benefits from their hard work.

Reavis is a freelance writer and security consultant. He can be reached at jim@reavis.org.

AES vs. Triple-DES

	AES	Triple-DES
Type of algorithm	Symmetric, block cipher	Symmetric, feistel cipher
Key size (in bits)	128, 192, 256	112 or 168
Speed	High	Low
Time to crack (assume a machine could try 255 keys per second — NIST)	149 trillion years	4.6 billion years
Resource consumption	Low	Medium
NIST standard number	N/A	FIPS 46-3

Top ISP REPORT



Is your ISP measuring up? Find out with our Top ISP Report, a joint venture between *Network World* and eTesting Labs' Internet BenchMark service (www.etestinglabs.com). The data on the right is for June 2001; each month you can go online at Network World Fusion for the latest data. The chart at right shows you the top dial-up ISPs in the market, and how they performed in eight metrics, as determined by eTesting Labs' data. We analyzed 23 ISPs (check out Network World Fusion for the list); if your ISP isn't listed among the top performers, ask them why they're not performing as well as their competitors.

Top ISPs profile, June 2001

Network World Analysis

National Retail
AT&T WorldNet Chinks in the armor? AT&T barely tops a strong-charging Verizon West.

Regional Retail
BellSouth A solid performer, but PacBell is close in second; this market always has mixed results, so check specific categories closely.

Business-to-Business
UUNET (GridNet) A new top dog for this month, the best performer in seven out of nine categories tested.

How we did it

Our data comes from eTesting Labs and its Internet BenchMark division. *Network World* takes the data and applies statistical analysis to rate the relative performance of each ISPs compared to the other ISPs within the same market classification (national, regional or business-to-business ISP). Based on that analysis, we rank the top ISPs for the month listed. The chart on the right lists the top three ISPs that perform above the average for the metric listed in that classification.

More information on our analysis can be found on our Web site at www.nwfusion.com, DocFinder 5326.

Top performing ISPs (June 2001)*

	National	Regional ISPs	B2B ISPs
Initial modem speed Measurement of the negotiated connection speed to your ISP once the call has successfully gone through.	AT&T Broadwing AOL	BellSouth Qwest PacBell	UUNET (GridNet) AT&T (GNS) UUNET
Average for market:	48.18K bit/sec	47.88K bit/sec	47.70K bit/sec
Average time to log on Reflects the time taken to connect and authenticate to a provider network access server once the modem takes the line off-hook.	AT&T EarthLink Broadwing	Ameritech SBIS RCN	UUNET (GridNet) Genuity AT&T (GNS)
Average for market:	29.44 seconds	31.41 seconds	28.98 seconds
Average download time The time taken for the Web page to download, including all page content. Calculated by measuring the time from the first HTTP TCP packet being sent to the server until the last HTTP TCP connection has terminated.	AOL AT&T Broadwing	PacBell Qwest BellSouth	UUNET (GridNet) AT&T (GNS) XO
Average for market:	24.42 seconds	25.27 seconds	24.97 seconds
Average DNS lookup The time from sending the first DNS query until a response is received from any query. This reflects the end-user perception of the DNS resolution time, including retries.	Prodigy AOL AT&T	Verizon-East PacBell Qwest	McLeodUSA Genuity XO
Average for market:	500.75 msec	499.26 msec	586.53 msec
Average Web throughput The effective transfer rate of the connection. The average of these Web throughput measurements is presented in the reports. Throughput does not necessarily reflect the bandwidth of the connection, but rather the effective Web throughput experienced using a connection.	AT&T Broadwing EarthLink	PacBell Qwest SBIS	UUNET (GridNet) XO McLeodUSA
Average for market:	4.78K byte/sec	5.03K byte/sec	5.13K byte/sec
Evening-hour call failure rate How often a modem call to the provider gets through successfully during the evening hours. A failure would include a busy signal, ring no answer, modem problem or logon failure. The lower the CFR, the better.	EarthLink Verizon-West AT&T	BellSouth Ameritech Qwest/RCN	UUNET (GridNet) McLeodUSA AT&T (GNS)
Average for market:	3.2%	2.6%	2.5%
Business-hour call failure rate How often a modem call to the provider gets through successfully during weekday business hours. A failure would include a busy signal, ring no answer, modem problem or logon failure. The lower the CFR percentage, the better.	AT&T MSN Verizon-West	BellSouth/SBIS Ameritech RCN	UUNET (GridNet) AT&T (GNS) Genuity
Average for market:	2.5%	1.6%	2.1%
Average total Web fail/timeout Any error message that appears as a dialog box for the Internet Explorer browser is considered a Web page failure. Any download that takes longer than 4 minutes to complete is canceled and considered a Web page timeout. A low percentage is considered better.	Verizon-West EarthLink AT&T/JUNO/BROADWING	Bell South/PacBell Verizon-East SBIS	Genuity Three others tied for second
Average for market:	.4%	.4%	.6%

*** We list the top three ISPs in each category; a complete list of the ISPs that outperform the average appears on NW Fusion, DocFinder 5326.**

Testers Choice

Thomas Henderson, Network World Global Test Alliance

A MODEST PROPOSAL FOR THE ZEROETH LAYER

There's something missing in testing network hardware and software products: testing the Zeroeth Layer. There clearly isn't a Zeroeth Layer in the ISO/OSI reference model, but I'm proposing to invent one and test it. Consider that the Zeroeth Layer is a working AC outlet with a suitable ambient environment for the product under test. Without that, of course, no product works. The Zeroeth Layer applies to hardware, and as an extension to software testing.

The idea of testing the Zeroeth Layer came during a long train ride with Ed Doherty, from American Power Corporation. Consider him co-inventor. APC, a maker of uninterruptible power supplies (UPS) and high-reliability infrastructure, is in the tricky and unenviable business of dealing with power problems and other ambient environmental considerations that are known to kill or maim network operations centers (NOC).

Houston was hit with several feet of rain a few weeks ago, which also affected large portions of the South. At the same time, wildfires threatened northwestern Nevada. This arrived after floodwaters consumed parts of the upper Mississippi and Missouri River flood plains. It wasn't a pretty weather picture, and this sort of environmental difficulty has become the norm rather than the exception. A lot of equipment died; some networks could be corrected, others were dead. The consequences were devastating for some organizations. An amusing item ran recently in the Indianapolis daily newspaper warning us to carefully examine used cars for sale, lest we might buy one from a Texas flood. A long list of telltale flooding signs accompanied the warnings. I'm wondering about flea market backbone routers, too.

One of Ed's proposed answers to Zeroeth Layer instability was to embed software into a line of UPSs that would go to weather Web sites that monitor lightning at fixed intervals, to check strike density. Too many strikes on its way to the NOC under watch, and UPS logic might start an automatic shutdown sequence in advance of the bad weather. The thought is intriguing, as my local power company can't keep the grid up when faced with such obstacles as pigeons, let alone Midwestern thunderstorms.

With various benchmarks that test network product speed, congestion and even bizarre data types, our industry presumes a great deal about this underlying but unmentioned layer of the ISO/OSI stack. Fault tolerance, availability and the unexpected aren't often part of the criteria that we get to test. The ability to withstand environmental problems has always been an assumption (read presumption) in testing network devices.

Yet any net engineer will tell you forehead-slapping stories about equipment failure where the probability of such an occurrence was below the noise shelf of probability. It's been noted that in a redundant connection to the Internet, both connections will ride on the same telephone pole that a drunk driver will take out. Testing for the Zeroeth Layer suddenly starts to make more sense.

Henderson, who is principal researcher for ExtremeLabs of Indianapolis, can be reached at thenderson@extremelabs.com.

Painless performance reviews

IT executives share their secrets for conducting solid performance appraisals of their employees.

BY BONNY GEORGIA

Heartburn-inducing and paperwork-producing they may be, but every boss knows performance reviews are a necessary part of staff management.

Just like doing your taxes, the secret to headache-free performance reviews is to track progress and mind the details throughout the year, rather than leaving everything to the last minute. Here are seven key strategies for eliminating the annual review mentality in favor of a performance management system.

1) Set realistic goals as a team.

Every formal review should end with a discussion of annual goals and objectives for the next evaluation period. Agreeing on them together increases the likelihood your staff will achieve them, says John David Frymier, director of IT infrastructure and engineering at Unisys in Bluebell, Pa.

"In January, we set objectives for the coming year. We try to include two or three objectives well within reach of employees and a couple of stretch objectives, which will challenge them to grow," Frymier says.

2) Provide regular, relevant and useful feedback.

Frequent staff meetings are the key to keeping performance goals relevant and employees on track. Frymier uses biweekly meetings to document progress on specific tasks and larger career-development goals. "This establishes a continuous feedback loop, so there are no surprises at the midyear or end-of-year reviews," he says.

Jeff Jones, manager of IS at Sterling Financial in Salt Lake City, accomplishes this with an open-door policy and a quarterly review schedule. "This constant feedback lets my employees know exactly where I stand and exactly where they stand with me," Jones says.

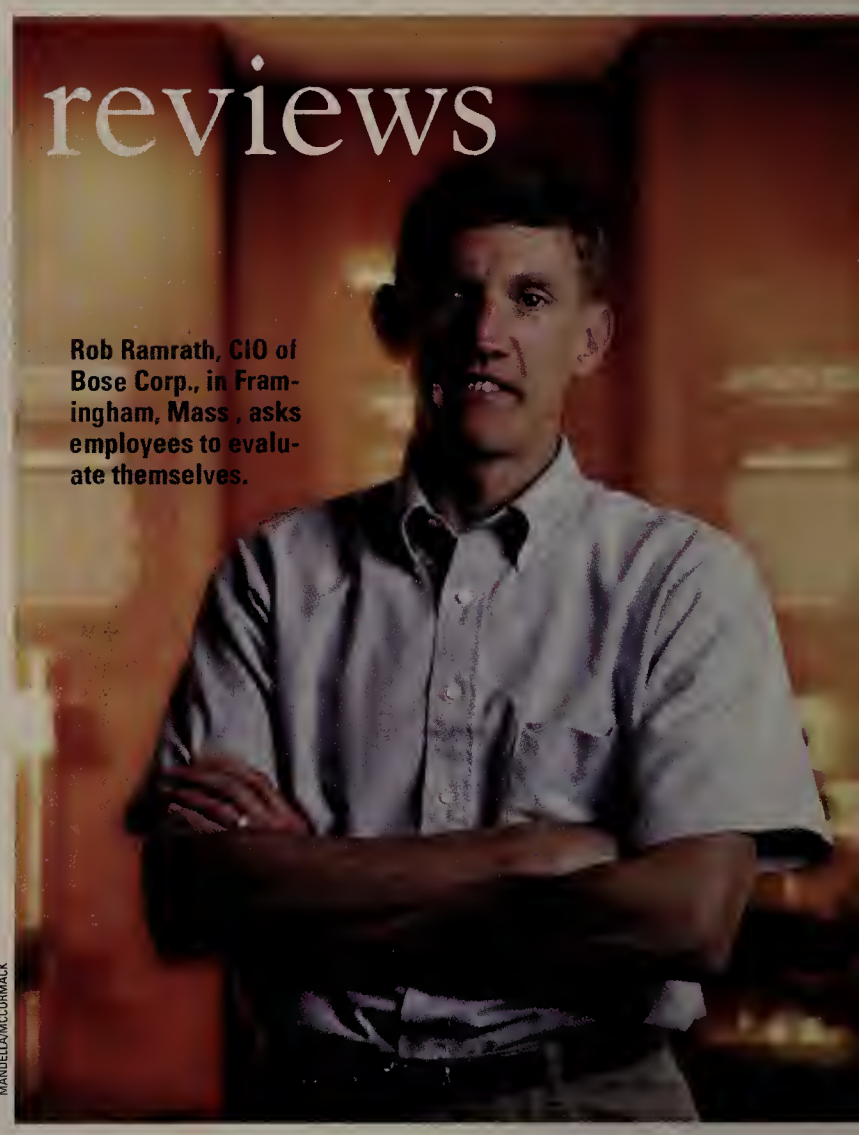
More important than praising employees for a job well done is the ability to deliver negative feedback constructively, says Bob Schwartz, president of Panasonic's management information technology division in Secaucus, N.J.

"When managers are avoiding negative discussions or aren't honest about a deficiency when they need to be, these situations fester. Then when the discussion finally does happen, the employee feels like he has not been treated honestly or fairly," he says.

3) Document progress throughout the year.

Whether your employee exceeds your expectations or falls short, keep a detailed record of progress toward each performance objective you've set. The more specific you are, the better you can justify your position during formal reviews. Frymier maintains a to-do list for each employee and notes the progress (or lack thereof) on each action item in his online database.

"We have 35 IT people working on things across four different geographical regions. It's impossible to keep it all straight without some sort of crib sheet," he says. "These lists help keep track of what's going on and ensures that people stay focused on what's important."



MANDELLA/MCCORMACK

Rob Ramrath, CIO of Bose Corp., in Framingham, Mass , asks employees to evaluate themselves.

4) Apply consistent evaluation techniques.

Work with your human resources department to develop a fair and defendable performance measurement system, and then stick to it. Panasonic's Schwartz begins by dividing objectives into technical competencies and soft skills. During each formal discussion, these areas are rated on a 1-to-5 scale.

"Earning a 5 is the equivalent of walking on water, while getting a 1 indicates they are drowning; 3.0 is mid-scale and identifies people as performing their jobs to our expectations," Schwartz says.

Rob Ramrath, CIO of Bose Corp., in Framingham, Mass., uses standardized forms and a similar ratings scale to evaluate his IT staff each quarter. "We use a 1-to-10 scale, where 1 means you've fallen short of all aspects of a given objective, and 10 means you've far exceeded objectives. Six means you did what you said you'd do," he says.

It's also useful to ask employees to evaluate themselves. Knowing how they view their own progress will provide valuable perspective and open the door to candid discussion, Ramrath says.

5) Be prepared for the review.

When it's time for the review, gather your supporting documentation, fill out the evaluation forms and decide what messages are most important to get across.

"If the employee only walks out of the office with one or two clear thoughts, what do you want them to be?" asks S. Diane Marentette, regional vice president and general manager at Personnel Decisions International, a human resources consulting firm.

Use specific examples when explaining points, and make sure you allow at least an hour for the discussion.

6) Use the right motivators.

If you want to encourage your IT employees to do their best in the coming year, it's not enough to simply wave a big paycheck. Take time to find out what really excites the person and use that as an incentive.

"The mistake many managers make is thinking IT people are highly motivated by money. Salary is important, but the type of technology [the staff] is working on, the environment in which they're working and the managerial professionalism will also factor into being able to attract and retain people," Schwartz says. Bose's Ramrath agrees, noting that employees want opportunities to gain new skills. "An open, honest, direct, healthy relationship with a manager is also essential. The No. 1 reason people stay in a job or leave a job is their relationship with their direct supervisor," he says.

7) Learn to recognize the square peg in a round hole.

Discovering an employee isn't fitting in after spending tons of time and money to nurture him is an IT manager's worst nightmare. If this happens, be honest with the employee and let him go, or try to find a more suitable position within the department, Frymier says.

For example, an employee who transferred into Frymier's strategic planning group had trouble relinquishing his previous hands-on implementation duties, and others continued to rely on him. In the end, transferring the worker back to his old group in an expanded role proved to be best for everyone.

Georgia is a freelance writer in Hudson, Mass. She can be reached at bonny@wordsatwork.net.

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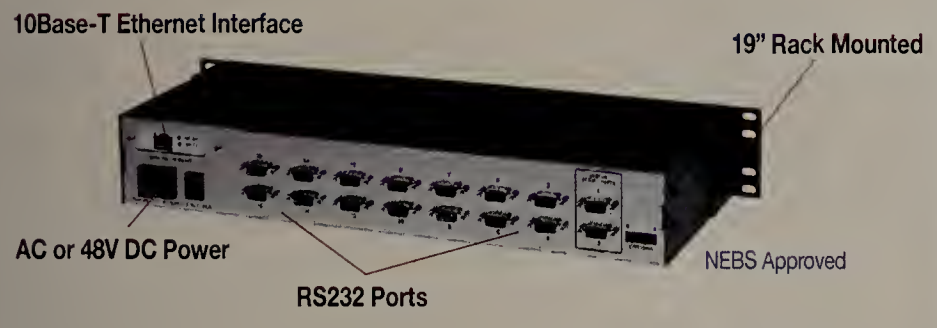

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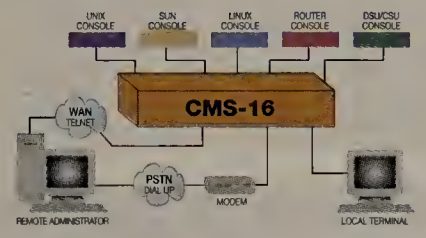

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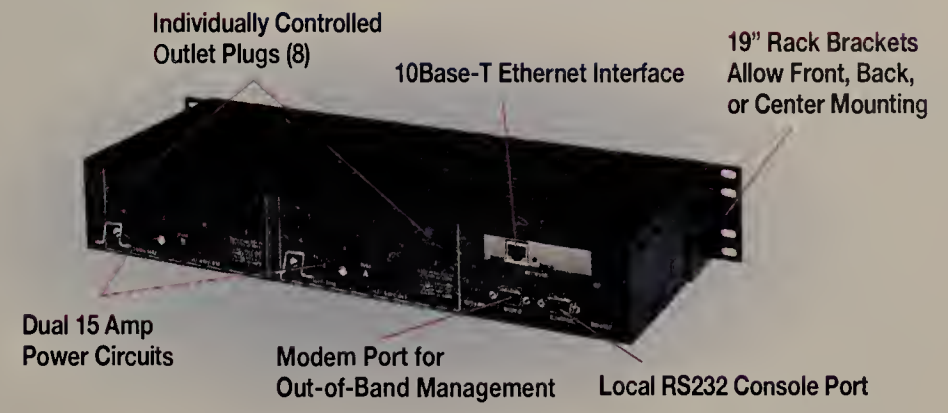

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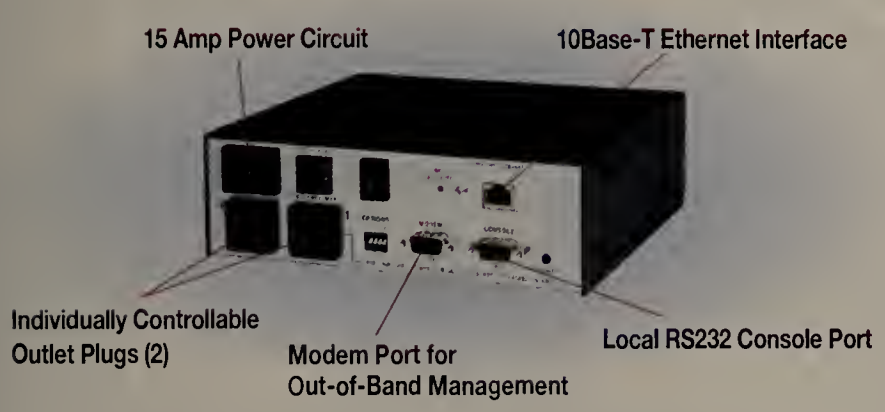
Telnet and Dial-Up AC Power Switch

Economical

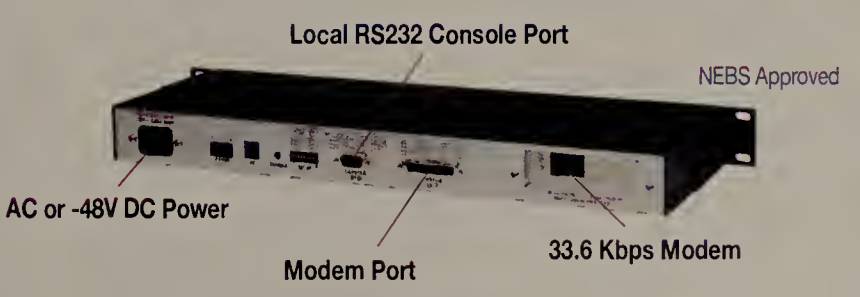


Telnet Power Switch (TPS)

- 2 Individual Outlets
- On/Off/Reboot Switching
- Outlet-Specific Password Security
- Network Security Features
- Manual On/Off Buttons
- Switches 15-Amp Load

Secure Modem for Remote Dial-Up Management

Dial-up Access to Equipment Bays



Secure Rack Modem (SRM)

- Up to 100 Individual Passwords
- Audit Trail Log With Time/Date Stamp
- Powers up to Specified Answer Rings and Baud Rate
- Remotely Configurable
- AC and -48V DC Power Options
- Standard "AT" 33.6 Kbps Modem

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Axiowave Networks, located just outside Boston, is a start-up dedicated to revolutionizing the networking industry by developing the next generation of equipment and software for the core optical network. Founded by an experienced and successful team, Axiowave Networks is well-financed and is currently building the strongest team in the hottest industry, optical networking!

- Hardware Engineers
- Electrical Engineers
- System Test Engineers
- ASIC & FPGA Designers
- Verification Engineers
- Modeling Engineers
- Optical Engineers
- Diagnostic Engineers
- Network Engineers
- Software Engineers
- Technical Marketing Engineers

The aforementioned positions are available at all levels and require a minimum of a B.S., M.S. or Ph.D. and 0-5 years' experience.

For all positions, send resumes to:

Attn: Human Resources
Axiowave Networks, Inc.
100 Nickerson Road
Marlborough, MA 01752
www.axiowave.com

We are an equal opportunity employer.

Software Engineer (Charlotte, NC): Part of core development team responsible for research, design, development, testing, documentation and maintenance of object oriented Internet Banking financial applications and related computer systems in UNIX environment using DB2 database and object oriented language. Will analyze software requirements to determine feasibility of design within time and cost constraints and customer specifications. Will consult with hardware engineers to evaluate interface between hardware and software and operational and performance requirements of overall system. Recommend technically feasible business solutions to meet client needs. Responsible for translating business specifications, user interfaces, mapping documents and logical data models of complex project lifecycles to create a technical design and database model with a feasible development process and specific time and cost constraints according to customer specifications. Must have Bachelor's Degree, or foreign degree equivalent, in Computer Science, Engineering, Information Systems or related field. Must have 1 year experience in position offered (Software Engineer) or 1 year experience in software analysis, design and development in business applications. Experience mentioned may have been obtained concurrently and must include: (i) 1 yr. experience in Object Oriented Design and Development; (ii) 1 yr. experience in DB2; (iii) 1 yr. experience in S.W.I.F.T. format specifications; (iv) 1 yr. experience in UNIX; and (v) 1 yr. experience in data modeling. Must have legal authority to work in the U.S. Send resume to : A. Dugan (REF:SE), S1 Corporation, 2815 Coliseum Centre Drive, Charlotte, NC 28217.

Systems Programmer Analyst, First Union Corp. position in Phil., PA. Design, enhance, code & test programs for enriching the functionality of the International Funds Transfer appl. Provide ongoing support for the existing prod. systems. Advise & assist internal customers in executing acceptance tests. Reqs. BA/BS in Electrical & Electronics Eng. or Comp. Science & 2 yrs in pos. offd. or as a Programmer, Analyst or Consultant. The 2 yrs rqd. exp must have incl work w/ appl. dvlp. on the Tandem platform using the Guardian Operating system, prog. lang. such as TAL, SCOBOL, DDL and TACL. 1 yr of the rqd exp. must have incl work w/ Pathway, Enscribe Database & TMF. 1 yr of the rqd exp. must have Incl. prog. for the SWIFT interface. $58,000 - $95,700, 40hrs/wk, Send resume & cvr. ltr. to Sabrina Miller, 1525 West W. T. Harris Blvd., NC0775, Charlotte, NC 28288-0775.

F/T Programmer/Analyst. Responsible for designing & testing applications using JD Edwards One World software 73.3 w/Oracle. Develop conversion programs & modify source codes using SOL, ODBC & Unix. Perform software modifications, evaluate business requirements & design customized applications. Must have Bachelor's degree in Computer Science, any Engineering discipline or related field. Foreign degree equivalent accepted. Must have 2 yrs. exp. in job offered or position w/same duties. Salary: $80,000, Resume to Brian Jones, PSS World Medical, Inc., 4345 Southpoint Blvd., Jacksonville, FL 32216.

Sr. Programmer Analyst-Analyze, design, develop, implement & support SAP systems & develop conversion methodology to support future SAP implementations. Monitor, maintain & enhance user interfaces, backend processes, database structures, reports & queries. Must have Master's degree in Computer Science, Physics, or Engineering plus 4 yrs work exp. Please fax resumes to Minolta Corporation, HR Dept: 845-358-6107

Softw. Dev. co seeks Sr. Developer; provide design leadership; Develop, implement and test web based and/or consulting tool software using Java/J2EE, XML, RDB, and rules engine technology; Tools and runtime environment includes Rational, IBM, Weblogic, Oracle, and ILOG products; Reqd. MS plus 1 yr exp or BS plus 5 yrs exp. or equiv. in edu & exp. in CS or related field; exp. in developing and implementing rules engine technology highly desirable; competent salary & benefits; reply to: brent_carlson@logiclibrary.com

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Computer Network (Support Specialist)-Customize client networks & advanced web applics. Provide tech'l advice on integrated IT solutions. Design software pkgs for business network'g systems. Hard & software integration, cabling, web integration & applics, program'g & troubleshoot'g. 35 hrs. $16.80 hr. 4 yrs exp. Fax resume to (305) 574-7882, Attn: Mr. Portillo.

The Gillette Company

INFORMATION TECHNOLOGY .... OPPORTUNITIES

The Gillette Company is the world leader in more than a dozen consumer product categories. Global World Class operations are increasingly dependent on Information Technology. Exciting opportunities exist in global business process integration initiatives. We are currently seeking the following highly qualified professionals to join the Gillette IT team in the Boston area.

The following positions commonly require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Admin., or similarly relevant field, and 3-5 years relevant experience.

/ Staff Programmer Analysts

/ (SAP) Staff Basis Administrators/Con-figuration-Integration Specialists/Application Developers

/ Data Warehouse Architects/Developers/Database Administrators

/ Telecommunications Analysts

Starting salaries range from $56,100 to $119,000 per year, together with paid vacation, medical, dental, life and disability insurances, and other industry-competitive benefits.

Please mail / email resume to: The Gillette Company, Prudential Tower Building, ATTN: Ms. Odelaine Durand, Corporate Recruiter, Boston, MA 02199. Email: Odelaine_Durand@Gillette.Com.

The Gillette Company is an equal employment opportunity employer

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Technical Account Manager (Nashville, TN) Responsible for planning, organizing, directing and controlling all aspects of development, implementation and project management of web based healthcare software product services for client hospitals and physician services utilizing Meditech software. Will work with clients to identify, design and develop new and existing custom software products, enhancements and sites. Will ensures delivery commitments to clients. Will create training materials and train clients on the use of software products. Must have a Bachelor degree or foreign degree equivalent with major field of study in Computer Science, Management Information Systems or related field (i) 2 years experience in the position offered (Technical Account Manager) OR 2 years experience in a position involving the design and implementation of healthcare software products; (ii) 2 years experience in healthcare information systems project management; and (iii) 1 year of experience in Meditech software. Must have legal authority to work in U.S. Send resume to K. Johnson HR (Ref: TAM), HCA, One Park Plaza, Nashville, TN 37203.

SR. PROGRAMMER ANALYSTS (2) Two--to develop front end VB 4.0 Report Modules and OLE DL1 to generate the functionality of reports. Create various reports using Crystal Reports, write stored procedures and develop data uploading programs. Understand & interpret user requirements, create & design documentation & specification, create forms, reports & queries to satisfy user requirements, test & troubleshoot forms & reports and make necessary changes per requests of end users. Must have B.S. in Elect Enginn or Computer Science + 5 yrs exp. SYSTEMS ANALYST (1) One -- to perform detailed analysis & consolidate various data sources to construct central data repository to be utilized to query & generate reports & solutions. Write reports, field survey & train end users. Must be efficient with Aperture, AutoCad, CorelDraw, CD Creator, Dbase, Harvard Graphics, Lotus 1-2-3, Microsoft Word & Excel, MiniCad, Photoshop, Primavera, Quark Express & WordPerfect computer software, required by Information Technology Consultants in New York, NY. Must have M.S.+ 3 yrs exp. Respond to: Andrew Le Guelaff, CEO, SVR Group, Inc. 750 Lexington Avenue, 27th Floor, New York, NY 10022. Fax: 212-888-4783.

Data Base Administrator sought by broadband bi-directional wireless communications provider located in Nashua, NH. Must have Bachelor's degree, or equivalent, in Computer Engineering, or in a related field and three years of experience in the field. Respond to HR Dept, Spike Broadband Systems, Inc., Millyard Technology Park, 11 Pine Street Extension, Nashua, NH 03060.

Hardware Engineer, wanted by optical networking system developer in Oceanport, NJ. Must have Master of Science in Electronic Engineering, Computer Science or related field and 1 yr. exp. in job offered. Respond to Doreen Connors, HR Department (ref# 033), Tellium, Inc., 2 Crescent Place, Oceanport, NJ 07757.

F/T Chief Technology Officer. Resp. for managing co. MIS dept., directing & monitoring all aspects of design, production, implementation, distributing & marketing of co. software applications product line. Must have Bachelor's deg. in CS, any Engineering discipline or related field. Foreign deg. equiv. accepted. Must have 8 yrs. exp. in job offered or position w/same duties. Salary $125,000. Resume to: Marcia Taylor, Bennett Technology Group, LLC, 1001 Industrial Pkwy., P.O. Box 569, McDonough, GA 30253

S/W Engineers to design, develop, implement business applications under client/server architecture using C, C++, Oracle, SOL, PL/SOL, Pro*C, etc on UNIX and Win OS; perform user req analysis and business rule implementation; create repeatable reusable process for handling errors, retrieval, updates, data download/uploads; write triggers, stored procedures and perform database tuning; train/assist end users. Require: MS or foreign equiv. in CS or Electronics/Computer Engineering. Salary: $80,000/yr f/t. Resumes to ECS, Inc. 8744 Main Street, Suite 101, Woodstock, GA 30188.

Systems Analyst-Provide primary support for SAP information system, including resolution of daily support issues, system enhancements & upgrades, monitoring daily program interfaces & enhancements, & assistance in the development of long-term SAP system strategies. Must have Bachelor's degree in Computer Science, Physics, or Engineering plus 3 yrs work exp. Please fax resumes to Minolta Corporation, HR Dept: 845-358-6107

Systems Analyst-Atlanta. Analyze, design, develop, test and implement software apps, using C++, Visual C++, VB, ASP, Oracle & Related tools, SOL Server, IIS, MTS, DAO/RDO/ADO, Roguewave, Orbix, Com/Dcom. BS Computer Science/Related Field with 2 years exp. in job offered required. Multiple positions. Travel to client sites req'd. Prevailing wage & Benefits. Contact HR, Wavesoft, Inc., 875 Old Roswell Rd., Suite B-300, Roswell, GA 30076. EOE.

Application Developer: Using Visual Basic, Visual Interdev, ASP, JavaScript, HTML, C++, DBMS & SQL server to design, develop, test & implement Internet & client server applications in an NT environment. Req. MS or equiv. In CS, CIS or MIS w. proficiency in Visual Basic, C++, JavaScript & SQL server, 40hr/wk, 8-5, $67,100/yr. Contact EnerTouch, Inc. 1899 Parker CT, Stone Mountain, GA 30087, email: careers@Enertouch.com.

Several computer related positions available for large software development, support and sales company, Degree, technical skills & experience vary per position. Send resume to Phylis Scott, MAPICS, Inc., 1000 Windward Concourse Parkway, Suite 100, Alpharetta, GA 30005.

Database Administrator. 8a-5p. 40 hrs/wk. Dsgn, dvlp, support d/base structures; do d/base performance tuning, coding triggers/stored procedures, systm analysis; maintain, tune, back-up, upgrade existing d/base; test & troubleshoot d/base client/server applics for data integrity, security & warehousing using Delphi 4GL, mSOL C API, PL/SOL, Oracle, Dvlpr & JDBC. Masters or equiv deg in Comp Sci, Electronics, Electrical or related branch of Engg. Job loc: College Park, GA. Send resume w/ref #001 to: HR Director, Stanley Associates, Inc., 300 N. Washington St, Ste 400, Alexandria, VA 22314.

Several f/t positions open for exp'ed Prog/Analysts and S/W Engineers skilled in some of the following: VB, HTML, Java, COM, IIS, ASP, Oracle, Developer 2000, Sybase, Oracle Databases, PL/SOL, Windows NT, UNIX, DOS, database admin, UNIX admin etc. All positions require a BS/MS with conc. in CS/Engg (any branch), Math, Business or related field (or its foreign equiv. in edu and exp). Highly competitive salary. 60% traveling involved. Sent resume to: InfoSmart Technologies, Inc. 385 Leatherman Ct. Alpharetta, GA 30005

Network Engineer, wanted by optical networking system developer in Oceanport, NJ. Must have Bachelor's degree in Engineering, Computer Science or related field and 2 yr. exp. in job offered or in Engineering. Respond to Doreen Connors, HR Department (ref# 039), Tellium, 2 Crescent Place, Oceanport, NJ 07757.

Senior Software Engineer. Client sites in New Jersey, Kentucky, and elsewhere. Masters degree or equivalent with 4+ years of experience in business process re-engineering and transformation, program and project management using CA Manman-X or BaaN ERP. Mon-Fri. 40 hrs/wk, excellent salary. Must have proof of legal authority to work in the U.S. Send resume to: info@geo-matrix.com

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Network Administrator: Assist w/installation & configuration of d/base & directory servers for deployment at customers' sites; monitor & manage d/base servers for uptime, backup, usage & performance; create custom installation & mgmt scripts for internal & external help desk tasks; provide localized help desk support for customers' help desk personnel on integrating their networking & applic server envrmt w/ATG s/ware. BS in Bus Admin, Comp Sci or rel field (or equiv educ & exp), +2 yrs exp in job offd or rel occupation such as systms administrator or similar duties under a different job title. Theoretical knowl or practical exp w/MS Win/NT, SOL Server, & Exchange server edition s/ware; Compaq h/ware & s/ware configuration; & MS VB-Script, SMS, or other scripting technologies. MS Certified Prof'l reqd. 40 hrs/wk, $43,137/yr. Mult job openings exist. Must have proof of legal auth to work in US. Send your resume to IA Workforce Ctr, 215 Watson Powell Jr. Way, Des Moines, IA 50309-1727. Please ref to JO IA1101408. Employer paid ad.

Ocera Systems has multiple openings for Software Engineers, Project Managers and Business Development Managers in Siebel CRM technologies. Please send a resume, with salary history & requirements to Mitchell Mahood, Ocera Systems Inc., 650 E. Sierra Vista Drive, #315, Las Vegas, NV 89109 or recruiting@qcerasystems.com

Systems Analyst- Analyze reqs & perform logical & physical database design using PowerBuilder, ORACLE, & C language. Hours: M-F, 9AM-5PM, 35 hrs/wk, $68,608/yr Req: Bach in Comp Sci, Math or Engr & 2 yrs exp. Employer is a Computer Consulting company. Relocation required to client sites for periods between 6 months & 2 years. Send resume to: Illinois Dept. of Employment Security, 401 South State St.-7 North, Chicago, IL 60605, Attn: Lydia Clarke, Ref # V-IL 26193-E AN EMPLOYER PAID AD, NO CALLS- SEND 2 COPIES OF BOTH RESUME & COVER LETTER. Applicants must show proof of legal authority to work in the U.S.

Software Engineer (Multiple positions, St. Louis, MO): evaluate, analyze, design, implement, troubleshooting and maintain Internet business software systems utilizing four or more of the following: C/C++, Visual Basic, Java, JavaScript, SOL, Oracle, Unix, HTML, PERL and ASP. Requires MS degree in Comp. Sci., Elec. Engr., MIS or in a closely related field (BS plus 5yr. progressive exp. is also acceptable.) Competitive salary. Resume to: Joel Svobada, Connectria Corp., 12443 Olive Blvd. 1st Fl., St. Louis, MO 63141. EOE

Call your ITcareers Sales Representative or Janis Crowley 1-800-762-2977

GART Sports Company is the largest full-line sporting goods retailer west of the Mississippi, offering the best and broadest selection of brand name products for the best value. We have a Job Openings in Denver, Colorado for:
Senior Programmer Analysts: Develop, Maintain and Document Processes on midrange systems by using Integrated Language Environment Tools, Report Program Generator, Control Language and Retail Applications Expertise.
Requires Bachelors degree in computer science or related field and 2 years experience as a Software Engineer.

Send resume to: Attn: Brian Taylor, GART Sports Company, 1000 Broadway, Denver, CO 80203

Programmer Analyst: Programs, tests, modifies, designs, and develops a multi-tier distributed client/server software system by implementing n-tier distributed COM-based in a Windows NT and UNIX environment. integrates related Delphi Database components as well as Visual Components. Library using Object-Oriented Analysis and Design methodologies. Uses system level interfaces such as ODBC, OLE DB as well as ActiveX Data Objects in performance of duties. Requires Bachelor's degree in Computer Science, Mathematics, or any engineering field. Also requires two years experience in the job to be performed; $54,330.00/year; 40 hrs. week, 8:00 a.m.-5:00 p.m. Two copies of resume to: MIKE BROOKS; DWE-FLC, P.O. BOX 7972, Madison, WI 53707-7972. Reference file #C101912.

Zephyr Associates, Inc., headquartered in Zephyr Cove, NV, in beautiful Lake Tahoe, is a leading financial analytics company that provides advanced investment analysis software to over 400 leading institutions. We are presently considering qualified applicants for:

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- Software Developers
- Quality Assurance Technicians

If you want to advance your career with a top notch company please forward your resume to:

Zephyr Associates, Inc.
E-Mail: aaron@styleadvisor.com

Concio head quartered in Santa Clara, California, a leader in software development and internet solutions, has multiple senior and entry level positions available for: Programmer Analysts, Software Engineers, Project Managers, IT Consultants, & Database Administrators. If you are a highly motivated individual send your resume to Concio HR Dept at 408-988-4051

Multiple openings available for exp'ed Prog/Systems Analysts, DBAs and Software Engineers involved in developing and designing s/w systems using C, C++, VB, VC++, Java, EJB, HTML, Oracle, Informix, Sybase, UML, Internet, telephony and wireless technologies, Windows/UNIX admin for Data warehousing, ERP, ERM/CRM Supply Chain, custom business applications etc... Require BS/MS or foreign equiv. Highly competitive salaries, some travel and relocation involved. Send Resumes to: Opal Soft, Inc. 3150 Almaden Expwy Ste 205, San Jose, CA 95118

Corliant, Inc. provides IT strategy consulting, systems integration and software development to clients nationwide. We have immediate, full-time opportunities for both entry-level and experienced professional in any of the following areas:

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- Functional (Financials, Logistics, HR)
- Technical (BASIS, ABAP, ALE/EDI)

NETWORKING
- Network Engineers & Consultants
- Systems Engineers (MCSE)
- LAN/WAN Specialist (CISCO)

APPLICATION DEVELOPMENT
- Microsoft Certified Solution Developer (Visual Basic, Visual C++)
- Database Administrators (Oracle, SOL Server)
- Web Based Development (Java or JavaScript, CORBA, Microsoft ASP, ActiveX, COM/DCOM)

Job opportunities are also available for Sale Managers, Marketing Managers, Business Managers, Human Resources Managers, Controllers and Technical Recruiters. Bachelor's or Master's degree required, depending on position. We also accept the foreign education equivalent of the degree or the degree equivalent in education and experience. Excellent benefits. Send confidential resume and salary requirements to: Corliant, Inc, 8 Neshaminy Interplex, Suite 209, Trevose, PA 19053. An equal opportunity employer.

Software Engineer-Parker, CO. Cold Fusion, Pro*C, Perl, SOL*Server, ASP, COM/DCOM, Oracle & related tools in UNIX/Windows. BS Science/Engg, with 5 years exp. or MS with 2 yrs. exp in job offered. Prevailing wage & Benefits. Multiple positions. Requires travel to client sites. Contact HR, Software Sources, Inc., 10356 Stonewillow Dr., Parker, CO-80134. EOE.

Software Engineer sought by computer s/w consultancy firm in Dayton, OH. Must have Bach or equiv and two yr relevant exp. Respond to: HR Dept., Recursive Technologies, Inc., 1336 Woodman Drive, Dayton, OH 45432.

Project Manager. Develop work goals and department projects. Designate staff assignments; establish work priorities. Review completed projects to ensure goals are met. Evaluate work load and capacity of computer system to determine feasibility of expanding or enhancing computer operation. Projects involved are Oracle financial, ERP projects and data modeling. Tools, RDMS, Oracle, Client Server on IBM Mainframe. Req. a Bachelor's degree in Elect. Eng. or Comp. Science and 1 1/2 yr. exp. Send resume to H. Felker, Blackwell Consulting Services, 100 S. Wacker Dr., #800, Chicago, IL 60173

Systems Integration & Consulting Services (SICS) is a SAP professional services firm that helps improve its client's business performance, through the intelligent application of information technology as well as a solution provider for e-commerce. We have position openings in Dallas, Texas for:
Software Engineers: Analyze clients business operations, identify problem areas and recommend system solutions. Design, test, code, revise and rewrite SAP systems, applications, design specifications, work flowcharts, develop modifications, enhancements and extensions of standard software system and applications. Require Bachelors degree in computer science or related field and 5 years experience.
Send resume to: Attn: Ronald Schaare, Office Manager, 1203 CrestSide Drive, Suite 300 Coppelle, TX 75019.

Computer Systems Analyst - Sioux Falls, SD: Install, customize, and maintain Customer Information Control System (CICS) software and other associated vendor products. Perform complex computer systems diagnosis & resolution, measurement & tuning to optimize online system efficiency. Prepare workflow charts and diagrams to assist programmers in areas of application and system design, coding, testing, and troubleshooting. Writes detailed description of user needs, program functions & steps required to develop or modify computer programs. Develop custom software as needed to enhance CICS. Conduct studies pertaining to development of new information systems to meet current & projected needs. Plans and prepares technical reports. Upgrades systems & correct errors to maintain system after implementation. Bachelor of Science in Computer Science & 2 years experience in offered job. Fax resume and cover letter to: Attn: R. Rogers; 605-330-6799. No calls please.

Systems Analyst wanted in Schaumburg to design, develop & implement fin'l applications & software packages for end user clients in fin'l industry; work in mainframe environment, using COBOL, DB2 & CICS; monitor & teach fin'l applications & software under development; monitor effective use of tools & methodology to mainframe project teams; direct appropriate documentation efforts for clients; supervise & train team of 5 Jr. Analysts to ensure timely & cost effective completion of projects. Must have B.S. in Comp. Sc. or equiv. + 2 yrs exp. 40 hrs/wk., $75,000/yr. **Applicants must show proof of legal authority to work in the U.S.** Send resume and cover letter IN DUPLICATE to Illinois Dept of Employment Security, 401 South State St. - 7 North, Chicago, IL 60605, att: Shella Lindsey. Ref. # V-IL 26778-L.

Advent Global Solutions Inc. is one of the fastest growing IT service companies in the United States. We are leading providers of ERP solutions. We have position openings in Houston, Texas for: Software Engineers: Research design, develop, and support computer systems. Evaluate SAP software and develop custom codes and conversions that automate specific business processes by utilizing different development tools, database environments and platforms. Interact with clients to design the functions of SAP according to client specifications. Requires Bachelors degree in computer science or business administration and 5 years experience as a System Analyst/Consultant. Send resume to: Anand, 17314 SH249, Suite #205, Houston, TX 77064

IT Opportunities

SignalTree Solutions is an established international IT solutions and services company. We provide our employees with a competitive compensation package and an excellent benefits package.

Currently SignalTree Solutions has multiple openings at our corporate office in Irvine, and project sites throughout the United States, for the positions referenced below:

Software Engineer
Sr. Software Engineer I
Sr. Software Engineer II
Project Manager
Project Leader I
Project Leader II
Technical Architect

Please send a letter of introduction (indicating position of interest) along with resume, salary history and requirements to:

SignalTree Solutions,
Attn: L. Bardakjian,
CW730,
133 Technology Drive,
Suite 200,
Irvine, CA 92618.
Fax: (949) 450-4658.

Email: lb.resume@SignaltreeSolutions.com

EOE

SignalTree SOLUTIONS

Senior Software Development Engineer. Job duties include: Responsible for all stages of development for software products, technical program specification, source code management, bug & feature tracking, & creation of final installers for product distribution. Specific product development technologies include: CodeWarrior on a Macintosh platform utilizing C & C++ languages, Adobe Illustrator SDK (versions 7, 8, & 9), & Metrowerks PowerPlant architecture. Specify, design, & write program code using the tools & operating systems described above to develop packaging system software. Analyze product quality to assure the quality of the software. Analyze software design & identify & correct problems. Provide installation, administration, support, & updates of Unix-based CVS server application & multi-platform CVS clients for source code management & product development. Provide installation, administration, support, & updates for the Unix-based Mozilla software "Bugzilla," the underlying Unix system & Apache web server installations, & implement such software in product development. Assist in Installer creation using Installer Vise. Plan & prepare timing estimates & project status technical reports. Design, develop, & propose new systems for product improvements for the desktop line. Prerequisites: Bachelor's degree in computer science or related field, plus five years of experience in software development or job offered. Competitive Salary. Job Location: Irvine, California. Send resume to: Mark Carpenter; BARCO Graphics LLC, ATTN: DOL-NU-1; 721 Crossroads Court; Vandalia, OH 45377.

Advertising Supplement

IT Careers: Certification, Training Offered in Multiple Formats

Anyone building a career in information technology knows this reality – you're only as good as the knowledge you have concerning the latest technologies. That's why education and certification programs continue to develop and be offered at vendor sites, in boot camp classrooms and online.

Bad Dog's Training Planet, Inc. in Grass Valley, CA, is a reseller of certification and training. Gary Tippner, company founder and president, says **Training Planet** has been reselling certification and training products for about three years. Prior to 1998, **Bad Dogs**' staff designed web sites and set up e-market opportunities for clients. "As the industry evolved and this area became more and more crowded, I started looking at where the profit margins were shifting," says Tippner. "Training and certification appeared as the areas of opportunity. "We evaluate manufacturers' certification products and services to identify the top training values for the dollar, then provide it to our customers," explains Tippner.

Despite increasing reliance on online e-learning, which allows self-study from home, Tippner believes that online training isn't always the best solution. "The bandwidth most users have available doesn't make this the best option. We're just not there yet."

Instead, **Training Planet** provides a combination of interactive CDs and video, as well as intense classroom learning known as boot camps. "The boot camps condense the learning into a five- or seven-day period, instead of months," says Tippner.

He notes that the training and certification market has softened some in recent months as companies cut back and individuals seeking training are holding off. "However, we're seeing continued growth from government agencies and education," Tippner says. "The hot

courses include CISCO, A+, Network+, CDIA document imaging, Oracle and MCSE. Being certified shows that the person has reached a level of competence that is accepted and valued by the industry. Also, many employers require certification as a condition of employment or for advancement opportunities."

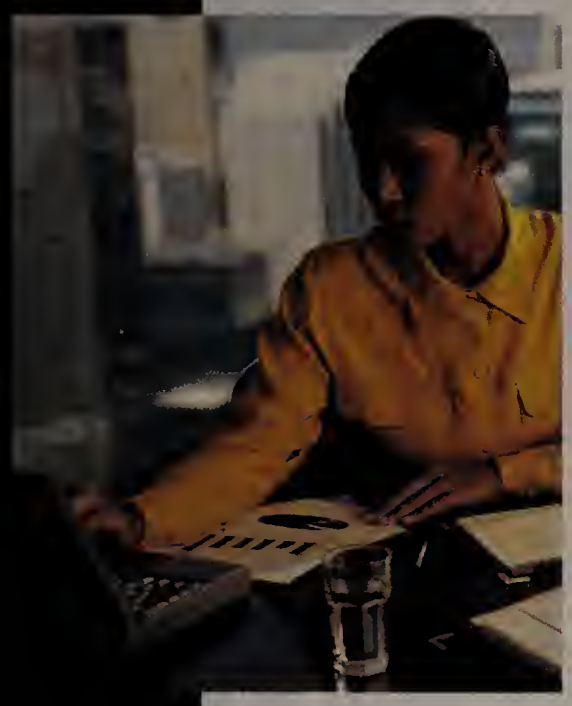
For mare jab appartunities with certificatian and training firms, turn ta the pages of ITcareers.

- If you'd like to take part in an upcaming ITcareers feature, contact Janis Crawley, 650.312.0607 ar janis_crawley@itcareers.net.
- Praduced by Carale R. Hedden
- Designed by Aldebaran Graphic Solutians

Programmer Analyst: Plan, develop, test and document computer software using ORACLE FORMS, DESIGNER, ORACLE, Visual Basic, PL/SQL and debugging tools, including program construction, distributed processing and enhancement of software systems for wider applications. BS in Comp Science (or equival) & 1 yr exp. Send Resume: HR Dept, eTransitions, Inc., 11 Grist Mill Rd, Lebanon, NJ 08833.

WITI LeadershipXcellence™ Online

Advancing Women Through Technology



Acquire the skills you need to take the next step in your career. Become a WITI Certified Leader.

"...the first module was fantastic! I'm very enthusiastic about this course! Thank you."

Linnis Jellinek, CFP

WITI, the premiere association advancing women through technology, introduces LeadershipXcellence Online – the first online leadership development and training program specifically designed for women.

- Take the courses that coincide with your needs – LeadershipXcellence Online starts with personal analyses of your strengths and weaknesses. Based on the results, choose the courses that will bring out your potential to become a true leader.
- Attend class whenever and wherever you want – at home, from the office, or while traveling. There are no schedule conflicts, no wasted time or effort. When you are ready, you just click into class and start acquiring leadership skills.
- 100% Online: Practical audio and video presentation accompanied by assignments that reflect real work environment situations.
- Complete 6 courses to become a WITI Certified Leader, or simply choose individual courses to improve your personal skill-level. What you learn can be immediately applied to your career success.
- You'll be studying with other successful professionals, creating a strong network as you learn. Instructors are accessible, giving personal advice and coaching in threaded discussion groups.
- Individual LeadershipXcellence Online courses can easily be completed in 4 weeks – it's an affordable and fast way to jump start your career.

Take the LeadershipXcellence Assessment Demo by going to http://leadx.witi.com – enter the userID "witi" and the password "witi"

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V.92,
continued from page 1

"The biggest reason ISPs are not quickly upgrading their dial networks is that they want to save money," says Steven Harris, an analyst at market research firm IDC.

ISPs are under financial strain and have dramatically cut capital expenditures. For example, Genuity has reduced its budget by $5 billion over the next three years.

Some say the benefits of V.92 will not be worth the pain of a networkwide upgrade, according to Daryl Schoolar, an analyst at Cahners In-Stat. But this is a narrow-minded view, analysts say, especially when you consider that about 50 million U.S. households connect to the Internet via dial-up.

The majority of those users are consumers. IDC says 92% of the 25.2 million home offices in the U.S. access the Internet using a dial-up connection, and that number is not expected to decrease dramatically until 2004.

While it's true that the latest standard doesn't offer a huge bandwidth boost, some users have no choice but to use an analog modem, making such an upgrade their only avenue to improved performance.

Dial-up alternatives

Users may prefer DSL or cable-modem services because they are faster, but each service has its own set of drawbacks.

Neither service is available nationwide, so a network manager in charge of his company's teleworker program may have to negotiate with several ISPs to get service for all employees.

Moreover, cable-modem service providers such as Comcast, Cox Communications and AT&T Broadband's MediaOne prohibit customers from using their standard cable-modem services to access corporate networks such as VPNs.

Users are also losing confidence in DSL service providers as provisioning horror stories abound and companies such as NorthPoint Communications drop off the map.

Dial-up service is not the fastest way to access the Internet but is generally available everywhere and costs about $30 less per month than DSL and cable-modem service.

Embarcadero Systems, a container shipping company, is pushing its teleworkers to sign up for DSL or cable-modem service, but still depends on dial-up access when its executives travel. The company uses remote access service from iPass, which lets remote workers dial local numbers to access the Internet from 150 countries.

"When iPass supports V.92 in its [points of presence] we'll start upgrading" laptops, says John Montgomery, director of technical services at the San Francisco company.

The company would like to offer users better dial-up performance but is limited by what the ISPs in the iPass consortium support. UUNET and Cable & Wireless are among the 170 ISPs that make up iPass' network, so Embarcadero users may be waiting longer than expected for improved service.

ISPs that do not keep up with the latest analog standards will be playing catch-up later on, In-Stat's Schoolar says.

Users can buy V.92-capable modems from Zoom Telephonics, U.S. Robotics and Multi-Tech Systems, but cannot use the new capabilities unless their ISPs also support V.92. Dell will offer V.92 modems as a standard option for laptop and desktop PCs in the fall. Compaq is offering a V.92-upgradable modem with its machines, although the necessary Lucent software is as yet unavailable.

Users are only now becoming familiar with the capabilities that V.92 offers compared with V.90-compliant modems. Like V.90, the ITU's previous modem standard, V.92 supports downstream speeds up to 56K bit/sec. But that's where the similarities end.

V.90 modems support upstream speeds of 33.6K bit/sec, while V.92 modems support upstream speeds of 48K bit/sec. Initial modem negotiation with an ISP's access concentrator is expected to be 25% faster than with V.90 modems, and the Internet call-waiting feature is new.

NaviPath believes users want these new features, but Schoolar notes the ISP may have had an easier time upgrading than other providers. Because NaviPath only uses one vendor — Lucent — it was a smooth software upgrade, he says. "Some providers have heterogeneous networks that are cobbled together, making it more difficult for them to make changes to equipment," he adds.

EarthLink is in this same boat.

"We estimate this is a very expensive proposition," says Steve Dougherty, director of systems at the ISP.

"There is a chance we won't support it at all. We outsource about half of our modem support and the rest we manage in-house using Nortel, Lucent and 3Com gear. It's sort of messy for us," he says.

Wait-and-see mode

There doesn't appear to be a market driver for V.92, says Roger Florkowski, manager of network management systems at UUNET.

Cable & Wireless agrees.

"We're in a wait-and-see mode," says David Edwards, director of Internet dial services at Cable & Wireless. "We're just starting to see some [requests for proposal] from customers that ask questions about where we are in our plans to support V.92. But no one is including it as a requirement at this point."

While Cisco, Cable & Wireless' primary access concentrator vendor, is offering a V.92 upgrade, the service provider does not have any of this gear in-house.

"We're watching our pennies," Edwards says.

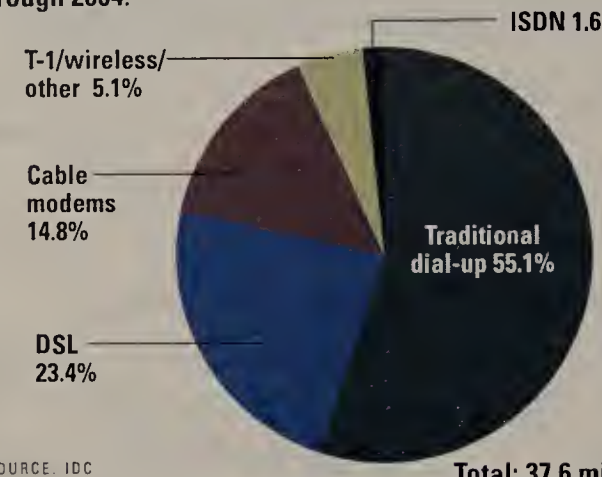
But other service providers such as AT&T, Sprint and Genuity see V.92 as an opportunity.

"We're excited about [V.92] and what it provides our customers. There has been a downturn in the broadband market, and it's not growing as expected," says Steven Piacentino, IP product management director at AT&T. "Dial will be around for many years, and we need to drive advances in this technology."

AT&T has been testing software from its primary dial platform vendor for three months and will likely start upgrading its network before year-end. Sprint also expects to begin upgrades this year. Genuity did not offer a time frame. ◪

Dial-up continues to dominate home-office usage

Despite the predicted explosion of DSL and cable-modem broadband Internet access services, dial-up is expected to be the most widely used technology for home-office workers through 2004.



SOURCE: IDC

Total: 37.6 million users

Dial-up facts and figures

Service providers in the U.S. point to decent revenue stemming from dial-up Internet access services. Here are some findings from a recent report from Infonetics:

In 2000:

- National service providers spent $930 million on their dial networks.
- Dial access service revenue hovered near $195 million.
- There were 102,000 dial ports.
- Dial ports will grow by 76% in 2001 to 180,000.

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Cisco acquires VPN acceleration company

BY JIM DUFFY

Cisco last week announced an agreement to acquire privately held Allegro Systems of Milpitas, Calif., a developer of VPN acceleration technologies, for $181 million.

Allegro's hardware and software will boost the ability of Cisco's VPN gateways and concentrators, firewalls, intrusion detection systems, and device and policy-based security management systems to support more scalable VPN security, Cisco says.

Allegro's VPN acceleration products are designed for high-bandwidth networks and enable a large number of simultaneous VPN connections required for e-commerce and remote access applications.

Allegro was founded in August 2000. The 39 employees, led by CEO Mano Murthy and CTO Ashwath Nagaraj, will join the VPN and Security Services business unit in Cisco's Enterprise line of business.

Under the terms of the agreement, Cisco common stock will be exchanged for all outstanding shares and options of Allegro. Cisco currently holds a minority investment in Allegro. Cisco expects the deal to close by the end of October.

The acquisition is only Cisco's second this year after the company acquired 23 vendors last year. Cisco bought AuroraNetics, a developer of 10G bit/sec technology for metropolitan fiber networks, for $150 million earlier this month. ◪

Merger,
continued from page 1

This year's second quarter also paled compared with this year's first quarter. The first quarter saw 47 deals worth a total of more than $6.5 billion completed — a fraction of the more than $241 billion spent on mergers and acquisitions by the NW200 in the first quarter of last year.

That's not to say there weren't some big deals during the second quarter, especially in the software market, where Peregrine Systems purchased rival help desk software maker Remedy for just more than $1 billion, and IBM paid more than $1 billion for Informix's database business.

Still, more deals of that magnitude are likely to be few and far between this quarter, experts say.

"A lot of the companies in the NW200 are larger companies that are currently going through a rationalization process," says Dan Williams, a vice president with Broadview International, a mergers and acquisition advisor specializing in the IT and media fields.

> ***"Bigger companies are shying away from adding any more risk."***
>
> Dan Williams,
> vice president,
> Broadview International

"Buying up other companies isn't at the top of their list of priorities," Willliams says.

The mergers and acquisitions frenzy is over

In the more freewheeling days of 1999 and early 2000, NW200 companies struggled to keep up with demand for their products and services, and tried to keep pace by acquiring other firms, Williams says. This wasn't too difficult for them, because most of the NW200 companies had high-priced stock they could use to swing their deals.

But with demand for many IT products and services falling off and stock values at a fraction of their one-time highs, the mergers and acquisitions frenzy of 1999-2000 isn't likely to come back soon.

"Bigger companies are shying away from adding any more risk," Williams says. "They already have poor visibility in their own businesses as far as future demand goes. Why would they want to acquire more uncertainty?"

However, for companies with cash on hand or shares that have held their value, this is a good time to buy, Williams notes.

There will also be consolidation in some sectors as companies come together in an attempt to build enough of a strength to survive the downturn.

"The Polycom/PictureTel deal is a good example of that," Williams says.

Consolidations on the horizon

One NW200 sector that may be ripe for consolidation is optical networking, says Jamie Simms, managing director and co-head of the mergers and acquisitions group at investment bank Adams, Harkness & Hill.

"At Supercomm down in Atlanta, there were a ton of optical and switch vendors," Simms says. "At the end of the day, those businesses will consolidate, because there's just not enough room for that many companies."

Cisco snapped up one such company — metropolitan-area network equipment maker AuroraNetics — earlier this month. Cisco, which spent $150 million in stock on the company, had previously not made a single acquisition this year after making more than 20 last year (see related story, page 64).

Another factor that may hinder merger and acquisition activity for the NW200 down the road is the elimination of the pooling of interests accounting method, used by companies such as Cisco.

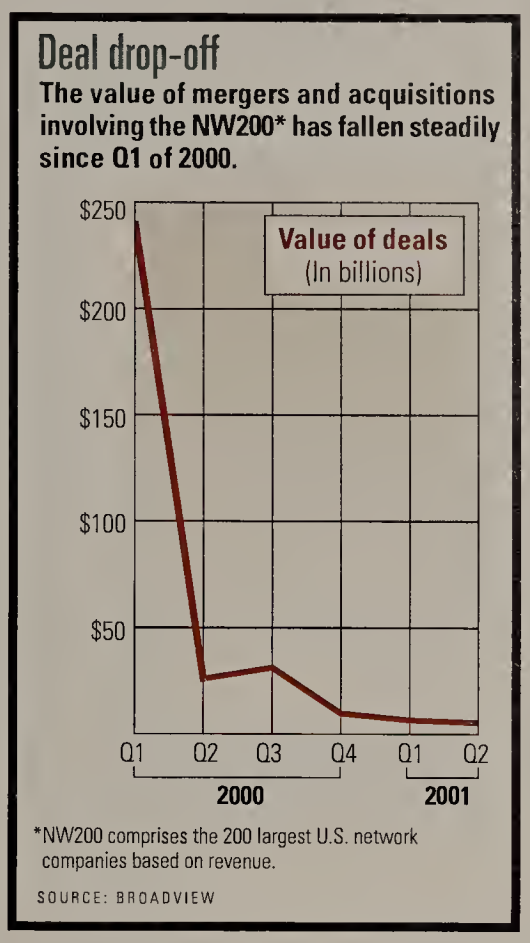
The Financial Accounting Standards Board (FASB) released new regulations on how companies must account for mergers earlier this month, and the rules may be more stringent than many people had hoped, Simms says.

Under the pooling of interest method, companies could write off any premium paid for a company over that company's book value relatively easily, he says.

But the new FASB rules make it much more difficult for companies to allocate any premiums paid to goodwill.

For companies, this means hefty purchase prices will directly affect their bottom-line financial results.

"It's going to be harder for companies to buy [other companies] for things like strategy or a customer base," Simms says. "They're going to have to take a harder look at the bottom line." ◪



Wheeling and dealing

The top 10 acquisitions by major U.S. network companies in Q2:

Buyer	Seller	Value (M)
Peregrine Systems	Remedy	$1,078
IBM	Informix	$1,000
EDS	Structural Dynamics Research	$898
EDS	Systematics	$559
Verizon	Telus	$520
Polycom	PictureTel	$362
Internet Security Systems	Network Ice	$215
Mercury Interactive	Freshwater Software	$147
Genuity	Integra	$113
IBM	Mainspring	$78

SOURCE BROADVIEW

SonicWall,
continued from page 8

Ruben Rabago, director of technical services for healthcare applications service provider SCINET in Scottsdale, Ariz.

SCINET connects about 100 of its customers' medical offices to its network via VPN as well as about 22 SCINET sites using SonicWall firewall/VPN hardware at each site.

This approach can restrict access to customer VPN policies, reducing the numbers of people with access to each device. This decreases the likelihood of inadvertent mistakes and increases security, he says.

GMS can limit what management screen authorized administrators can see and whether they get read-only access or privileges to change policies, he says.

With the new version of GMS, SonicWall makes it possible to use an Oracle or Microsoft SQL database to store VPN management data rather than SonicWall's proprietary database. This lets companies such as SCINET write their own queries to the database to generate specific reports, says Ryan McConky, a senior network engineer for SCINET.

SonicWall says this feature makes it possible for the database to tie into back-office applications such as billing and provisioning systems that are compatible with Oracle or SQL databases.

With GMS 2.0, users can tie management of their VPNs into larger enterprisewide management systems such as those made by Hewlett-Packard, Tivoli and Computer Associates. They couldn't before because GMS didn't support SNMP.

GMS 2.0 will ship next month. Customers with earlier versions will get a free upgrade if they have a service contract.

SonicWall: www.sonicwall.com

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Periodicals postage paid at Southborough, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. *Network World* (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by *Network World*, Inc., 118 Turnpike Road, Southborough, MA 01772-9108.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

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Backspin

Being in denial

here I was, July 20, in the business center of a hotel in downtown Paris when my personal denial-of-service nightmare began. I was downloading the 423 e-mail messages that had accumulated during two days of travel and it was taking what seemed like forever.

I assumed the hotel just had a bad connection and so I watched as the mail dribbled in and the better part of an hour vanished. Just as I was receiving the last message, wham! My laptop died.

Without warning and for no discernable reason, the machine stopped dead. Despite my best efforts, which included changing batteries, looking for loose connections and telling the machine I would find an ax and give it a reprogramming it would never forget, it remained obstinately a digital stiff — an ex-laptop.

MARK GIBBS

I returned to my room with a feeling of emptiness that can only be appreciated by other computer addicts who have been parted from their 'puters with no alternative in sight. In my case, this deficiency was to last another six days!

Anyway, I switched on CNN to find that my denial of service (caused, I suspected, by angering the gods of laptop computing) was nothing compared with the denials of service in progress in the wider world.

It turned out a train fire in a Baltimore tunnel July 20 let loose large quantities of noxious chemicals and created a major service problem for vast areas on the Internet. It seems the tunnel was a primary route for fiber-optic cables used by many big ISPs. The accident destroyed the cabling and slowed communications on the 'Net. The problem was widespread enough that the slow connectivity in Paris was probably due to that same accident (I was retrieving my mail from a computer on the U.S. West Coast).

I find it interesting that the telephone companies have major circuits in one physical location. It creates a situation analogous to configuring the U.S. highways so a car accident on the New Jersey Turnpike causes gridlock in Los Angeles.

Now, wouldn't you think that the government would be concerned about such a situation? Here's a national service critical to the economy and it can be taken out without much effort (I suspect one lunatic with a chain saw could have the same effect).

Such a situation makes you wonder if the government is taking the idea of info-terrorism seriously.

Anyway, as if the train tunnel problem wasn't enough, another denial of service — this one caused by human maliciousness — was also causing widespread problems. It seems some jolly hackers decided to pick on the White House and mounted a distributed denial-of-service attack. This involved a significant number of machines and, combined with the train tunnel problem, created even worse Internet traffic woes.

If you haven't looked into denial-of-service attacks, check out Gibson Research's Web site (www.grc.com). There you will find a fascinating and detailed account of how Steve Gibson dealt with a distributed denial-of-service attack mounted by three 13-year-olds who heard Gibson had insulted them. Their attack basically took grc.com off the Internet for days until their ISP added filtering to their routers.

Just imagine the cost of this attack: days of Gibson's time, days of the ISP's time, lost service, lost revenue — it all adds up fast. Now think of what the distributed denial-of-service attack on the White House must have cost!

What are we going to do about these infrastructure problems? We have a highly vulnerable physical fabric, which supports nationally strategic services and transports costly information, combined with a protocol suite that is itself highly vulnerable to attack. The longer we leave this problem unsolved, the harder it will be to implement a fix in the future.

Your thoughts to nwcolumn@gibbs.com. The sooner I get my laptop fixed, the sooner I can answer your letters from last week.

'NET BUZZ

The latest on the Internet industry

PAUL MCNAMARA

Whoever said imitation is the sincerest form of flattery never had chunks of his Web site copied word for word by an upstart competitor.

They are anything but flattered at **AlertSite,** a small Web site monitoring business in Boca Raton, Fla. Two weeks ago an eagle-eyed AlertSite employee stumbled upon a press release on the site of **WebSitePulse.com,** a previously unknown rival. Here are the first three sentences:

"ORLANDO, FLA. — May 2001 — Do you know if your Web site is up? WebSitePulse.com does. WebSitePulse.com, a division of Image Project, Inc., announced a free innovative Web-based service that monitors Web sites around the clock. Site owners receive instant notification when problems are detected."

The AlertSite employee sent a copy to public relations professional **Andrea Milrad,** along with a note that read, "Recognize this?"

She sure did. Milrad wrote those exact words — save for the dateline and the company name — back in September 1999 at the launch of AlertSite's service. The rest of the release is Milrad's work as well.

There's more. WebSitePulse.com's FAQ section is riddled with the type of ham-handed plagiarism that will land a high school student in hot water faster than you can say cut-and-paste.

So does WebSitePulse.com have an explanation? Buzz decided to start to search for an answer by calling **Linda Burton,** the contact name on the pilfered press release.

"I have no idea," Burton said. "I just answer the phones here."

A freelance marketing guy, **Nick Nichols,** wasn't any more helpful, insisting that he just started working with WebSitePulse.com and would never be party to such shenanigans. (He is party to other shenanigans involving customer testimonials on the site, but we digress.)

"If you've been on the Internet for any length of time," Nichols added, "you know this kind of thing goes on all the time."

Do tell.

Finally, I heard from **George Tudor,** vice president of technology development, and — surprise of surprises — he didn't know about the rip-offs either. Nor did he act overly concerned, noting more than once that Web sites for similar services are likely to feature similar verbiage.

The next day Tudor sent me an e-mail in which he promised to make sure that a new press release was posted with "wording . . . dissimilar to their release to the extent possible."

To the extent possible? Could the man sound any more put out?

Oh, and they'll clean up the FAQs, too.

"Though we do not consider these similarities vital for us or for AlertSite," Tudor said, "our FAQ page is being reworked for the peace of mind of our friends at AlertSite."

While Tudor consults his thesaurus, his "friends" at AlertSite say they are consulting their lawyers.

Earlier this month, **Disappearing Inc.,** had in its possession a promising e-mail management product and a clever name that gave the company a leg up in the all-important branding game.

Now they've got only the promising product.

The "disappearing" part of the clever name was a reference to the software's ability to set "expiration dates" on e-mail. Reach that date and the message, in essence, disappears.

However, Disappearing Inc., recently began doing business under the moniker Omniva Policy Systems.

"They needed a name that was more descriptive of what they really do: provide policy management software that enables companies to more effectively control their e-mail and other electronic assets," says a spokeswoman. "Omniva Policy Systems reflects a broader definition of the company."

That's called thinking too much.

We embrace change more cautiously here. The address is still buzz@nww.com.

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